The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Colonial Chemical Developments

FROM a Canadian source we learn that the Consolidated Mining and Smelting Co., of Trail, British Columbia, contemplates erecting, within the next two years, a large synthetic ammonia plant. This announcement follows that of Canadian Chemical Industries, Ltd., of their intention to erect a synthetic ammonia plant near Windsor, Ontario. In addition, there is the further report now to hand of the merger arranged between the three leading fertiliser companies of Australia—the Mount Lyell Mining and Railway Co., Cuming, Smith and Co. Pty., and Wischer and Co. Pty. —with Nobel (Australasia) Ltd. With two of these projects Imperial Chemical Industries has an indirect, though important, association. It would seem, therefore, that at least two of our colonies, Australia and Canada, are regarded as future markets for synthetic nitrogenous fertilisers, though their potential consumption capacity is obviously the chief consideration, rather than their present custom. It is also noteworthy that although reminders are frequent that the world production of nitrogen compounds is more than equal to consumption, there is no lack of faith in the future of synthetic products, and no apparent fear about new enterprises on the part of the chief producers.

With regard to the Canadian scheme, it is pointed out, in a general survey of the situation by *Canadian Chemistry and Metallurgy*, that Canadian Chemical Industries has its "dual parentage" in Imperial Chemical Industries and the Du Pont Co., the respective pioneers of the synthetic industry in England and in the United States. The suggested Windsor plant has available some by-product hydrogen, and its immediate market would appear to be Central and Eastern Canada. The factors which have led the Consolidated Mining and Smelting Co. to enter this field appear to have been of a different order. The enormous potential production of sulphuric acid from smelter-gas, it is stated, has been obvious for some time. In fact, a solution for this nuisance has long been urgent. The plant is situated in an area where claims for damages to crops from sulphur dioxide are possible. The Consolidated Co. have endeavoured to work out a cycle of industries that will utilise this waste. Canada was not known to have commercial phosphate rock comparable to that available elsewhere. This company set out to determine Canadian resources in this respect, and were fortunate in locating commercial phosphate in British Columbia, a relatively short distance from their works. The next step was a consideration of the possibilities of a synthetic ammonia plant at Trail. There is no ready-made market in Western Canada for any great tonnage of nitrogen, although there is a necessity for the increased use of fertilisers. Factors involving export are an important consideration to a plant of any size in British Columbia. In the Pacific area in particular, British Columbia nitrogen products, it is thought, should be on a competitive basis with those from any other direction.

Looking at the total volume of business in fertiliser sales in Canada at the present time, the amount is not impressive. "We spent," states the journal already quoted, "only a little over two million dollars last year. Exports of fertiliser materials consisting of ammonium sulphate and cyanamide were more important, amounting to over five million dollars. The basic fertiliser industry of this country has two major considerations, one of which is the serious development of the Canadian market, and the other the problem of competing in certain world markets. High-priced fertiliser materials are not within the range of many sections of agriculture under our present system of land operation; but the spread between basic chemical costs and what farmers pay per unit of valuable material would seem to offer some opportunity for stimulating demand, by selling methods which were desiged for volume, rather than large profits on small scale production. Farming is in general such a complex matter, and is so dependent upon a large number of factors for success, that the use of fertilisers as a single element is frequently either not given the attention it deserves or is expected to do

too much. The chemical end of the fertiliser business, through recent developments, has entered a new stage in this country and has created an active selling factor in the Western Provinces."

In Australia, the fertiliser industry is older and, at the moment, more developed. Some of the firms in the new amalgamation have already attained their jubilee. With the experience and resources of Imperial Chemical Industries available through the Nobel association, the manufacture of synthetic fertilisers within the colony would seem to be a natural development with great possibilities. Already the merger is large enough to dominate the industry, and as rationalisation proceeds, costs of production should come down and synthetic fertilisers be brought more easily within the buying capacity of the colonial farmer. In the Colonies, in fact, the synthetic fertiliser industry would seem to be only in its infancy.

U.S.A. and Chemical Cartels

THE four-days' conference recently organised in Paris by Mr. C. C. Concannon, Chief of the Chemical Division of the Bureau of Foreign and Domestic Commerce in Washington, is well worth the attention of those interested in British or more general European chemical industries. It was presided over by Mr. D. J. Reagen, Acting Commercial Attaché at the Paris Embassy, and it was attended by United States Trade Commissioners, commercial attachés, and other "field men" of the United States Department of Commerce who are following chemical matters on this side. The discussions, we understand, were concerned principally with domestic administrative matters, but incidentally they turned on general chemical developments and European conditions, especially the cartel system. A number of American business men who happened to be in Europe at the time were present and took part in the discussion. Mr. Concannon expected to be in London towards the end of this month, and probably, in addition to interviews with members of the British chemical industry, some conference similar to that in Paris will be held during his stay.

These visits testify to the increasing American interest in the European situation and in foreign markets generally. Immense as the American home market is, it is not sufficient to absorb the entire home output, and attention must more and more be given to export markets. All this applies particularly to chemical products, and it is with problems affecting the export aspects of American chemical industry that Mr. Concannon and his alert colleagues are primarily concerned.

The European cartel system was not unnaturally among the matters that came up for consideration, and the general impression appears to have been that it was not suited to American conditions and to the strongly individualist temperament of the American chemical man. That was clearly the view of Mr. Concannon himself. While admitting that European chemical cartels are creating severe competition with American chemical interests in the foreign field, he finds among people interested in the cartel system a fear that it may contain the seeds of its own decay. All the same, at the moment, in the matter of dyestuffs the European chemical cartels are presenting a united front in China, and American interests are finding it difficult to operate in that territory. Students of the cartel movement, Mr. Concannon states, point out that one participating industrial unit often tends to secure dominance over others. Some groups, it is said, may be lulled into inactivity through finding their profits much the same whether or not they produce up to their quota.

Such a process, it is contended, represents one of the seeds of decay which the system itself carries. Assuming the accuracy of the theory, it is bound, Mr. Concannon argues, "to manifest itself in acute form in the chemical industry, for that industry is one of rapid and continuous change. Any groups failing to progress would be finished in a hurry, for chemical plants are often obsolete by the time they are completed, and all units must, to live, keep plugging away at scientific research."

The view was expressed by many present that the conference succeeded in assisting various units of the foreign service of the U.S. Department of Commerce to greater coordination of their efforts. It was pointed out that the conference was one of the first of its type ever to be held, and it is an evidence of the U.S. Government's desire to render full service to American industry in the foreign field.

Chemical Engineering Data

INQUIRIES continue to reach us from time to time as to whether there is any available reference book relating to chemical engineering data and other information of similar kind. So far as we know, there is none, and it would be interesting to know what demand there would be for a handy volume, comprising standard data tables, personal information of the "Who's Who?" type and similar facts. The Chemical Engineering Group, we believe, included in its original objects the publication of data sheets, but it has not been possible to carry the idea through, though one or two sheets may have been prepared. This work is of first-class importance to a science that is acquiring increasing recognition, and would form an indispensable feature in any official reference book. The idea is worth considering, and it would be interesting to know how it appeals to members of the profession.

Books Received

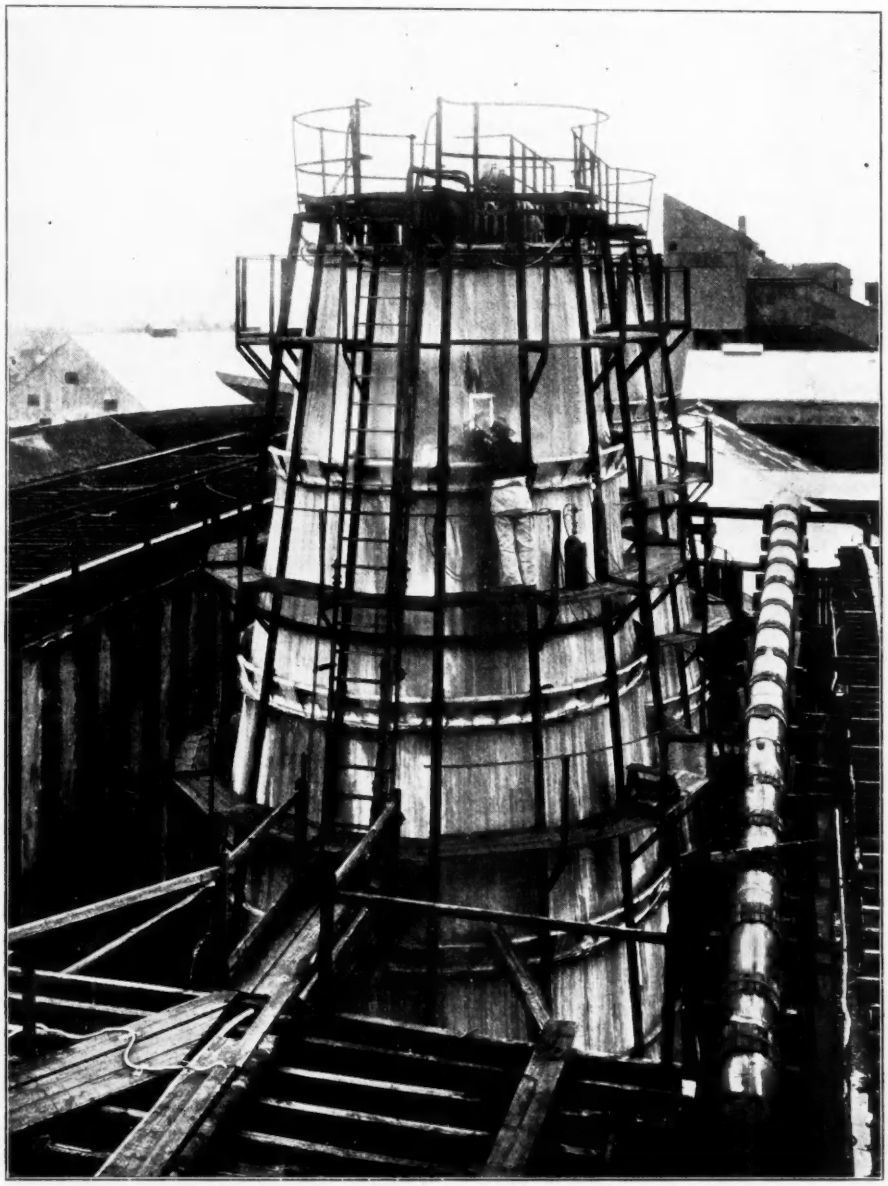
INTERNATIONAL INDUSTRY AND THE YOUNG PLAN. By Lord Melchett. London: London General Press. Pp. 23. 2s.

ECONOMIC CONDITIONS IN THE PERSIAN GULF. By Lieut.-Com. Forester. London: H.M. Stationery Office. Pp. 26. 1s. 3d.

The Calendar

Sep. 9–12	Institute of Metals: Autumn Meeting.	Düsseldorf.
10	Iron and Steel Institute: Autumn Meeting.	Newcastle-upon-Tyne.
11 &12		
17	Iron and Steel Institute: Additional Meeting. 6.30 p.m.	Secondary Schools, Doncaster Road, Scunthorpe.
26	Iron and Steel Institute: Additional Meeting. 7.30 p.m.	Chamber of Commerce, 95, New Street, Birmingham
Nov. 8	Annual Chemical Dinner.	Connaught Rooms, London.

Repairing an Acid Chamber



ABOVE IS SHOWN A STRIKING PHOTOGRAPH OF THE MANNER IN WHICH REPAIRS ARE EFFECTED ON ACID CHAMBERS BY MEANS OF OXY-ACETYLENE LEAD-BURNING. THE OUTFIT REQUIRED (WHICH IS SHOWN) IS LIGHT ENOUGH TO BE CARRIED TO POSITIONS WHICH ARE RELATIVELY DIFFICULT OF ACCESS. THE PHOTOGRAPH IS REPRODUCED BY COURTESY OF ALLEN-LIVERSIDGE, LTD., WHO WILL SHOW A WIDE RANGE OF OXY-ACETYLENE OUTFITS AT THE SHIPBUILDING, ENGINEERING AND MACHINERY EXHIBITION AT OLYMPIA, LONDON, SEPTEMBER 12-28.

American Chemical Engineering Comes of Age

What it has done for Industry

In connection with the coming-of-age of the American Institute of Chemical Engineers, "Chemical and Metallurgical Engineering" has collected statistics showing the distribution of chemical engineering graduates in American chemical industry. These are reproduced below, together with explanatory notes on the figures by Mr. James A. Lee.

TWENTY-ONE years ago a small group of chemists and engineers led by Richard K. Meade, Charles F. McKenna, William H. Walker, Arthur D. Little, J. C. Olsen, and William M. Booth, met in Philadelphia to form an organisation that would advance the then new cause of chemical engineering and would help to raise its professional status and standards. Last month, within a day of the exact date of the anniversary, the same organisation met in the same city and demonstrated the progress it has made toward the original goal of its founders.

Technology and economics found a balance on its programme that indicated the very practical character of the chemical engineer's work. That both should be reflected in a number of striking technical and commercial developments is evidence that the combination is fundamentally sound. Synthetic solvents from petroleum and new resins that hold the promise of better lacquers and plastics mark the beginning of industries. Successful commercial manufacture of a useful chemical such as aluminium chloride after fifteen years of patient trial and experiment, and the large-scale production of a new commodity, such as diphenyl, to fill an important need in process development, are examples of practical technique in applying chemical engineering.

Value of Education

But the best proof of the maturity of the American Institute of Chemical Engineers lies in the fundamental value that it has placed on the processes of education. In previous conferences held under the auspices of its committee on chemical engineering education, representatives of industry and of the colleges and universities have agreed on important bases of definition and application. But in the Philadelphia conference, Prof. W. K. Lewis struck the keynote of a greater purpose in training men not for industry but for civilisation. It is the engineer rather than the lawyer or the doctor who by training, experience, and habit of thought is equipped to solve the complicated problems of to-day. He alone understands the machine, can improve its shortcomings, and can appraise its potentialities for good or bad. It is to the colleges and universities, therefore, that we must look for the development of chemical engineers of character and ability who are willing to accept this greater obligation to the community as well as to the profession.

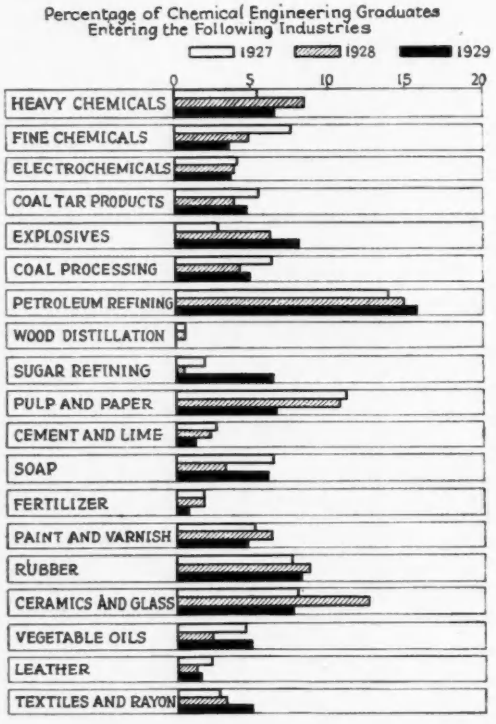
Now that chemical engineering has come of age it is important that its growth and development should continue on an ever-broadening scale. There is much to be done in broadening its membership and extending its influence into fields in which chemical engineering is only beginning to penetrate.

A Survey of the Position

Registration in chemical engineering in U.S. universities and colleges increased by more than 20 per cent. last year. Sixty of the 80 institutions that give courses in chemical engineering reported a current output of 740 graduates. Of the number that went directly into industry the figures show that one in every six went into petroleum refining, while only one in fifteen was absorbed by the strictly chemical industries. These and other interesting deductions and trends are revealed as the result of an extensive survey that *Chemical and Metallurgical Engineering* has conducted.

Questionnaires were sent to about 80 institutions that were known to offer courses in chemical engineering and that participated in a somewhat similar survey in 1922 made by the committee on chemical engineering education of the American Institute of Chemical Engineers. The data requested covered the distribution of the graduates among nineteen process industries, the number of undergraduates and post-graduates, the size of the graduating classes and the total number of students registered in the departments. Figures were requested for 1926-27, 1927-28 and 1928-29. Although responses to the questionnaire were received from 60 institutions, only 45 reported data for all three sessions, while some replies were only partially complete and a few stated that authoritative and comprehensive information was not available.

The distribution in the process industries of the chemical engineering graduates of the classes of 1927, 1928 and 1929, based on only the replies containing complete data, is shown in the accompanying chart. The percentages for the first year are based on 315 graduates from 45 institutions, for the second year on 310 and for the third year on 360. While these figures are based on only about 50 per cent. of the total number of graduates from all of the institutions, it is doubtful if the percentages would be materially different if the entire number were considered. For example, the figures for the Massachusetts Institute of Technology, which were received too late for the preceding compilation, show the following distribution for the 1928-29 class of 49 chemical engineers: Petroleum refining, 16; explosives, 4; heavy chemicals and rubber, 2 each; electrochemicals, coal-tar products, pulp and paper, paint and varnish, and leather, 1 each; industries not listed in the chart, 7; and graduate work, 13.



In the strictly chemical industries where there is complete recognition of chemical engineering, there is continued demand for young graduates in this branch of engineering, with only one exception: the figures indicate a slackening in the demand for engineers in the fine chemical field.

The petroleum refining industry has attracted twice as many 1929 graduates as has any other individual industry. It apparently is moving with a constantly increasing acceleration toward a scientific basis, and absorbing more and more chemical engineers. Indications are that petroleum will be even more of a chemical engineering industry in the future.

The rubber industry is one of the group of industries in which there is a predominance of mechanical and electrical rather than of process operations, and so limits the extent to which chemical engineering may be a production factor. However, in January, 1928, it was estimated that only about

65 per cent. of the possible penetration of chemical engineering in this field had occurred, but there is increasing evidence, such as is indicated in this tabulation, that appreciation of the chemical engineer by the rubber industry is becoming more pronounced. Webster H. Jones, general superintendent, processing division of the B. F. Goodrich Company, made the statement at the recent chemical engineering education symposium, that in recent years his company has been employing proportionately more chemical engineers than chemists. This, he said, was because the engineer was more flexible and offered greater adaptability to the problems of the rubber industry.

So far there have been considered merely the industries that chemical engineering graduates have become associated with on leaving college. It is of interest, however, to observe the nature of the occupations of the men ten years after graduation. For this purpose statistics of the chemical engineering classes of 1919 and 1920 of four typical institutions have been compiled and are summarised below.

Occupations of Men Ten years after Graduation.

	Per cent.
Chemical engineers and industrial chemists	43·7
Research chemists	9·2
Teachers of chemistry	8·4
Chemical salesmen	3·7
Industrial work, non-chemical	4·4
Non-industrial, non-chemical	13·3
No occupational record available	17·3
	100·00

A consideration of the facts presented show that at least 65 per cent. of the men graduated about 10 years ago are using their technical knowledge in their present occupations.

On November 1, 1927, 5,987 students were enrolled in the chemical engineering courses of the 148 engineering schools of the country. In the list of approximately 30 engineering courses, chemical engineering ranked fourth in numbers registered.

There has been a remarkable increase in the total registration during the past two years, and the numbers that have remained to take graduate work are unusually large in some schools.

Prof. Charles A. Mann, chief of the Division of Chemical Engineering, University of Minnesota, states that over 65 per cent. of his students remain in schools to do graduate work.

Death of Dr. S. B. Schryver

Dr. Samuel Barnett Schryver, F.R.S., professor of biochemistry in the Imperial College of Science and Technology, died at his home, 32, Bolton Gardens, London, on Wednesday.

Professor Schryver, who was born in London in 1869, the son of the late Lewis Schryver, was educated at University College School, University College, London, and Leipzig, and was first appointed assistant lecturer and demonstrator in chemistry at Liverpool. He next returned to London as lecturer on physiological chemistry at University College, and was also appointed chemist to the Research Institute of the Cancer Hospital, where he did much sound and careful work, which has been put on permanent record in a number of published papers. In 1913 Dr. Schryver became a member of the staff of the department of biochemistry at the Imperial College, and in 1920 he was appointed professor of biochemistry. He was elected a Fellow of the Royal Society last year. His researches dealt mainly with organic and biological chemistry.

Stainless Steel in Canada

A new subsidiary of the Shawinigan Water and Power Co., to be known as Shawinigan Stainless Steel and Alloys, Ltd., is commencing operations at Shawinigan Falls. Control of the new company is held by Shawinigan Chemicals, Ltd., which in turn is controlled by the Shawinigan Water and Power Co. It is stated that the foundry is the first in Canada to confine itself to the manufacture of alloy steel castings of all descriptions, which includes stainless heat-resisting steels, corrosion-resisting steels, wear-resisting steels, carbon steels, specially annealed steels and duriron steels. This new addition to the important group of industries at Shawinigan Falls will also be, it is believed, a large user of electricity, its equipment including an electric heat-treating furnace and two electric steel furnaces of one ton and two tons capacity respectively.

The Hydrogenation of Coal

Work at the Birmingham Research Laboratory

The report has just been issued of the work of the Mining Research Laboratory of the University of Birmingham in 1928. It is stated that work on the hydrogenation of various coals has been continued, and particular attention has been paid during the past year to the properties of the products of hydrogenation and to the effect of catalysts in increasing the rate of reaction between hydrogen and coal. Various materials have been used for this purpose, the most successful being ammonium molybdate. With this catalyst Cockshead coal left only 5·5 per cent. residue insoluble in phenol, whilst 12·6 per cent. of light spirit and nearly 60 per cent. of tar oil were formed. It has been shown that coals differ in their ease of hydrogenation under the same conditions of temperature and hydrogen pressure in the absence of an added catalyst and that, generally speaking, those of the para-bituminous class are most readily converted into liquid products. Certain exceptions have been found to this rule, and it is concluded that the chemical constitution of the compounds contained in the various coals is of considerable importance in deciding whether a coal may be readily "liquefied."

Commercial Possibilities

A report summarising the work so far carried out on the hydrogenation of coal has been prepared, by the assistant-director (Mr. J. Ivon Graham), for the British Colliery Owners' Research Association. In this report an attempt has been made to indicate the commercial possibilities of the process, and the conclusion has been arrived at that for the hydrogenation of coal to be a commercial success the reaction between hydrogen and the constituents of coal must be speeded up either by means of catalysts or in some other way. Lines of research for the future have been indicated in this report.

The action of steam upon coal has been studied, under atmospheric pressure and also under considerably higher pressures in the autoclave. These experiments have proved very instructive, and in view of the variety of processes for the treatment of coal in which steam is also employed (*e.g.*, coking, in particular low temperature carbonisation methods employing steam, briquetting, combustion of coal with the aid of steam injectors, etc.) further investigations along these lines seem very desirable.

The Briquetting of Coal

The question of the removal of sulphur from a Scotch cannel coal containing a high percentage of this element has also been investigated. Another investigation engaging the attention of the Assistant-Director and Mr. D. G. Skinner has been the possibility of partial hydrogenation for the purpose of converting coal into a material capable of being briquetted by means of elevated temperature and high pressure without the aid of an added binder. The briquettes produced from certain coals by heat and pressure treatment have shown that the partially hydrogenated product would stand more than twice the compression required to fracture the untreated coal. A variety of coals have been tested in this way.

The briquetting of the products of hydrogenation was mentioned in the Annual Report for 1925 as being part of the programme of research, and the results of this work, to which reference has just been made, were thought to be of sufficient value to cover by patent for the British Colliery Owners' Research Association. A recently published patent under the names of Lander, Sinnatt and King (all of the Fuel Research Division of the Department of Scientific and Industrial Research) has, however, shown that the production in the coal itself of a suitable binder has been in the minds of these investigators. The work carried out in the Mining Research Laboratory in this direction, although incapable of being protected by patent, is, nevertheless, novel and should be of interest and value to the mining industry. The commercial possibilities of the process have yet to be ascertained.

New Post for Mr. J. E. Crane

Mr. Jasper E. Crane, chairman of the boards of Lazote, Inc., and National Ammonia Co., who will be remembered by many of our readers as a former London representative of the du Pont interests, has been elected a vice-president of E. I. du Pont de Nemours and Co., Inc.

Chemical Statistics

Their Bearing on Industry and Commerce

Mr. S. J. Cook, chief of the Mining, Metallurgical and Chemical Branch, Dominion Bureau of Statistics, Ottawa, Canada, recently presented the following paper before the 12th Dominion Chemical Convention at Toronto.

DEFINITIONS of statistics are almost as numerous as the somewhat satirical remark one often hears about statistics and statisticians. In a recent radio address, Mr. R. H. Coats, Dominion Statistician, stated that "Statistics is only another word for information—information expressed in numerical form." He went on to say that the great Belgian statistician, Quetelet, once collected 184 definitions of statistics. That was in 1869, and Mr. Coats said he thought fully as many new ones had been offered since then.

There is a quite commonly held belief that statistics are just figures; indeed, one learned writer described the subject grandly as "arithmetical literature." Some regard business statistics as the inclusive term descriptive of all numbers relating to a company's operations, and by these persons the bookkeeper, or in large enterprises, the accounting staff, are regarded as the company's statisticians. A finer definition excludes financial accounts as belonging rather to accounting than to statistics. Substituting the word chemical for business, for the purpose of present discussion, chemical statistics, it may be said, are numerical statements of facts, exclusive of financial accounts, which are used in the administration of chemical business. And, expanding the thought expressed in the term "administration," one sees that such a study may relate not only to existing enterprise, but also to the search for new markets for known products, and to the investigation of existing markets at home and abroad, where, by the substitution of new products for old, additional trade may be developed. Chemical statistics are thus seen to be a branch of research.

Two Classes of Statistics

Such statistics, as already indicated, are of two general classes—(1) external statistics, generally available to the public, which indicate the general trend of business and market conditions, and (2) internal statistics, which are concerned with the private operations of an individual business establishment.

Examples of the first class are the statistics of manufactures, imports and exports, agriculture, transportation, public utilities, bank clearings, prices, and population, such as are contained in the multitude of reports issued in Canada by the Dominion Bureau of Statistics. Internal statistics include those obtained from the sales, advertising and factory reports of an individual firm or company. Such records as these are indispensable to the proper conduct of a business; the degree of their development does not necessarily depend on the volume of business done; some concerns that enjoy a steadily growing trade owe their rise from relatively small beginnings to a recognised place in the commercial world very largely to the fact that a close statistical watch is continually kept on every branch of the business.

Not only in Canada, but in many other countries as well, the utility of making statistical studies in business was only recognised during and after the Great War. While the establishment in Canada of a federal bureau of statistical research was proposed as early as 1912, legislation creating the Dominion Bureau of Statistics at Ottawa was not passed until 1918; the chemical division was established in the next following year. Since then annual reports on Canada chemical industries have been published. Trade statistics, including data on the quantity and value of chemical products imported into Canada and exported therefrom, have been available through the annual and quarterly reports issued for many years, first by the Department of Customs and, in recent years, by the Bureau of Statistics.

Place of Statistics in Marketing Studies

One of the amazing things in industry is the fact that large sums are often risked in enterprises undertaken upon guesswork and optimism. While some manufactures have been started only after a careful study of conditions, others have been instituted after only a few inquiries and the decision to take the chance. Much of this attitude, no doubt, is a legacy of the past. In the early days the manufacturer had but two problems: to make the goods; second, to get them to the consumer. To-day, supply in most lines has caught up with demand and a third very important function devolves upon the manufacturer—namely, to develop his markets.

A feature that is perhaps characteristic of the chemical industry is the invasion of synthetic products replacing the natural or accepted product of yesterday. That this is so, furnishes further reason for the study of chemical statistics. The replacement of natural indigo by the synthetic product is an old story; air nitrates are more recent competitors of Chilean saltpetre and ammonia from the by-product coke ovens; acetic acid, acetone and a host of other chemicals made from carbide are produced in competition with the time-honoured wood distillation products; a multitudinous variety of the newer alloys, such as magnalium and, more recently, Columbia metal, have not only replaced other older and better known metals in certain work, but have made possible many wonderful accomplishments in other enterprises, as, for example, in aviation.

The Statistical Research Department

Where a manufacturer of a long-established product is confronted by competition of this kind, necessity demands that he look to his methods and markets, if he is to continue in business. Happy is he who with commendable foresight has gathered about him a commercial research or statistical staff, whose activities enable him not only to keep abreast, but usually ahead, of the tendencies in trade. Such an organisation, ably managed with a keen chemical research staff on the one hand and statisticians on the other, need never fear the competition of either home or foreign trade.

To say that knowledge is power is trite, but it is true. Knowledge is the foundation of modern merchandising regardless of product and, as competition grows more intense, it becomes more apparent that the chemical manufacturer must know in order to succeed.

But the manufacturer may say, "Why have a research department? I have so many salesmen that if I want to know anything I ask them."

To this query there are two obvious answers. (1) First, because these men are salesmen they are specialists in that particular field; they are handicapped in getting an impartial view of the situation. They see a part of the truth too clearly to get a fair vision of the whole truth. Second, because the function of a research department is not only to answer questions, but to discover influences that are escaping the attention of the manufacturer and his sales organisation. It is only natural that any organisation which specialises on a certain phase of an industry should, in the gaining of intensive knowledge of that phase, lose something of the perspective of the whole. A research department is therefore to supplement and broaden this specialised knowledge with pertinent information from allied fields. As competition in business has grown more acute there has been a greater necessity that every factor should be understood and every danger guarded against in order that success may be attained. Hence, there is an increasing necessity for research departments in business enterprises.

Examples

A writer recently gave the following examples of the utility of statistical research. A certain manufacturer in the central west was interested primarily in breaking into New York markets; research showed him that, totally neglected at his own door, there lay a larger market, easier to get, and likely to prove more profitable than the coveted New York market; research showed another manufacturer that his distribution was far from uniform; another, that he was restricting his line to jobbers when the possible sale for his goods was almost confined to those stores which aimed to buy direct; another who sold only direct that a major portion of the opportunities in his field could be best reached through jobbing channels.

Granting the value of research work, the chief problem is "How may it be conducted to produce results commensurate with the expenditure?"

At first sight it might appear that the problem of the research department is to answer inquiries, but further study will show that in order to attain its greatest usefulness it must go considerably beyond the answering of questions and perform the higher functions of formulating questions which ought to be asked. When a manufacturer has formulated in his mind a question for which he seeks an answer, all his experience, reading and thinking are brought to bear upon its solution, and while a research department can accumulate data that will help him in reaching a conclusion upon that point it can perform a more valuable service if it can discover tendencies of which the manufacturer is not conscious, and ask him questions which will lead to new lines of thought.

Research work should not only be dominated by honesty of purpose, but it should be conducted from the student standpoint of truth for truth's sake. Lines of inquiry that appear likely to prove of practical value should, of course, be pursued, but that which appears academic should not be neglected, for it frequently happens that what appears to be academic turns out to be highly practical, while something which appears likely to be practical often turns out to have very little value.

Methods of Commercial Research

The methods to be applied in commercial research are analogous to those used in science; namely, the gathering of a mass of facts, and then, with an abundance of data before one, proceeding cautiously from the general to the particular.

Some of the broader aspects, which should be borne in mind in formulating conclusions, may be suggested here.

First, the tendency towards concentration. In utility lines, theoretically, a single concern, if it excels, would secure an entire monopoly; or if a manufacturer so perfected his manufacturing process that he would be universally asknowledged to have the most efficient article at the price, theoretically everyone would buy his products. Practically, one manufacturer can attain a very high degree of efficiency in manufacture, but another can develop near enough to his standard to be a competitor; and practically, there is a value in a name and there is a difference in public opinion. Hence, it seldom happens that in any line where there is no protection by control of raw materials or patents anyone does attain an absolute monopoly. However, in these lines there tends to be concentration down to a very small number of manufacturers unless freight conditions affecting raw materials or finished product necessitate a sectional distribution of plants.

Chemical Concentration in Canada

In Canada, we are just beginning to see evidences of this concentration in the chemical field. Development of water power has led to a concentration of electrochemical industries in those areas where these water powers have been most developed; progress in the smelting and refining of the non-ferrous metals has led to the establishment in the vicinity of these large smelters of smaller industries utilising the by-product from the smelters as their raw materials; in other fields there has been a concentration of control where a number of small plants have been merged into a strong financial organisation, and as a result some of the weaker plants have been eliminated. In general, it may be said that industries must be fairly well established before any evidence towards concentration becomes apparent.

Second, convenience goods or shopping lines. If the manufacturer produces an article sold to the consumer, it is important to know to what extent it is bought by men and to what extent bought by women, for men and women purchase through different motives. It is of first importance to a manufacturer to determine in which classification his goods fall and to what extent either shopping or convenience buying is the prevailing motive. Upon this depends his method of sale. If he has a men's line or a convenience line his distribution is widely scattered and a multitude of small merchants handling his wares prefer to buy of the jobber. If, on the contrary, he has a shopping line of any considerable volume, the direct sales method will be found best adapted to his needs.

Third, scope of the market. In general, it may be stated retail and jobbing figures are merely the measure of human wants and economic possibilities, and when once the fundamental principles have been ascertained the extent to which sectional, racial and industrial and climatic conditions modify these fundamental tendencies is understood, one may estimate with a fair degree of accuracy the probable market for a given section.

Potential and Existing Markets

In estimating markets it should always be borne in mind that the potential market may be very different from the existing market. An industry which does not employ advertising may seem to have a small market, while if consumers were better informed, the market might be much enlarged. Or an industry which sells direct when it should use jobbers or vice versa, may fall materially short of satisfying its potential market. Hence, the potential market, though less tangible and therefore more difficult of study, offers the more important field for research work.

Fourth, seasonal sales. The manufacturer is usually conscious of the extent to which his sales are affected by seasons, but the graphing of the seasonal curves often proves interesting and of value in planning sales efforts.

Fifth, fundamental tendencies in the trade. The scope of a commercial research department is to ascertain that which is fundamental rather than to give attention to the ephemeral. This is a basic feature that must be continually borne in mind in statistical work.

Conclusions

All of these are examples of the applications that may be made of chemical statistics. In the assembly of useful data such as are required broadly to illustrate the trends in trade, the Bureau of Statistics seeks to meet the needs of economists, statisticians, and industrial executives, as well as to furnish the necessary data for the guidance of the Government in determining the most beneficial and satisfactory policies in matters relating to domestic and foreign commerce and to the financial structure of the nation's business.

A growing public appreciation of this service is apparent; whereas, in the earlier days, the Bureau had to struggle with a very general attitude of indifference and even antagonism on the part of commercial concerns, particularly in the completion of the necessary periodical questionnaires, there is now not only a diminution of reticence on the part of the manufacturers in this respect—there is even enthusiastic support of the Bureau and its work. Returns come in more promptly, making possible the earlier release of reports on the various subjects studied. More than that, there are almost daily offers of assistance in the collection of data.

This spirit of co-operation between the Bureau and the industries it serves is but an example of the breadth of chemical statistics. Not only production, imports and exports data are needed to give the chemical manufacturer and trader the information they require, but many other sources of commercial information must be brought to the co-operative support of these primary data, before adequate chemical statistics are obtained. It is an encouraging fact that in Canada, the rise in appreciation of statistical research has been rapid. Such a development points inevitably to progress that must lead, if not to supremacy, at least to continued and ever-growing prosperity in chemical manufactures and trade.

Spanish Olive Oil Production

THE association of Spanish olive oil producers (Asociacion Nacional de Olivareros de España) has issued the following statistics: The 1927-28 harvest amounted to 665,000,000 kg., and that of 1928-29 to 856,000,000 kg. The home consumption amounted in 1927-28 to 260,000,000 kg., and in the first 8 months of 1928-29 to 175,000,000 kg. The present stock consists of 297,000,000 kg. The consumption for the remaining 4 months of 1928-29 is estimated at 85,000,000 kg. and the export at 34,000,000 kg (this may possibly rise to 50,000,000 kg.). The 1929-30 harvest is estimated at 178,000,000 kg.

Chemical Exemptions from Key Industry Duty

THE Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, exempting mercury vapour rectifiers; neodymium oxide; praseodymium oxide; and yttrium oxide from Key Industry Duty from August 20, 1929, to December 31, 1930. The Treasury Order will shortly be published by the Stationery Office.

Production of Hydrochloric Acid

The Chlorine-Steam Method

WHEN hydrogen and chlorine are burned to produce hydrochloric acid, the temperature developed reaches 2,400° C., and yet the technique of combining these gases is now so well understood and controlled that hydrochloric acid can be safely produced in large quantities from its constituent elements. In its simplest form, the apparatus used for burning the gases in suitable proportions consists in its essential parts of a quartz tube 2 cm. in diameter and 4 cm. long, through which the mixed gases stream and burn in a quartz cylinder 50 cm. in diameter and 2 metres in height. In such an apparatus, 350 kg. of hydrochloric acid can be produced daily in the form of 20—21° Bé. acid. It can be reckoned that the formation of 350 kg. of 100 per cent. hydrochloric acid requires 9·6 kg. or 107 cubic metres of hydrogen, and that the 350 kg. of undiluted acid corresponds to 1,000 kg. of 20—21° Bé. acid.

Economics of the Process

The price of the latter at the German works is from 2·5 to 3·0 marks per 100 kg. In these days, when hydrogen has become of such great importance as an industrial raw material, it is by no means economical to use hydrogen to make cheap hydrochloric acid.

Without regarding the value of the chlorine and the cost of condensation, the above figures show that, for every cubic metre of hydrogen used, the value of the product is about 28 pfennig, whereas a cubic metre of hydrogen combined with 1·26 kg. of nitrogen to form ammonia has a much greater value. The comparison is even less favourable with coal liquefaction, where the increased value given by the utilisation of a cubic metre of hydrogen is considerably greater.

In the hydrochloric acid industry, the view has long been under consideration of endeavouring to obtain hydrogen in a cheap way for the hydrochloric acid synthesis, thus converting surplus chlorine gas into the acid. In certain countries, the United States and Italy in particular, and also in England, the so-called coke process, based on the discovery by R. Lorenz in 1895 of the reaction indicated by the equation $Cl_2+H_2O+C=2HCl+CO$, is used.

In Italy this process has suppressed the direct chlorine and hydrogen burning process. A. Aita and H. Molinari, in their recently published work, *Gli Acidi Inorganici-Solforico, Nitrico, Chloridrica* (Milan, 1928), p. 444 *et seq.*, refer to the importance of this reaction.

For a long time opinion was divided as to the degree in which carbon dioxide was formed by the interaction of steam, chlorine and coke. Recently, however, Neumann and Domke, by some comprehensive experimental work (*Zeit. f. angew. Chemie*, 1926, p. 368, and German Patent 427,539) have shown that carbon dioxide and not carbon monoxide is formed, according to the following equation:

$$2H_2O+2Cl_2+C=4HCl+CO_2$$

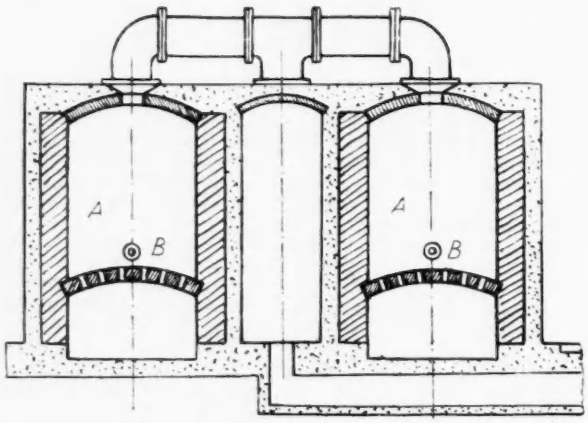
The Steam-Chlorine-Coke Method

Wood charcoal, with chlorine and steam, yields at 600° C. hydrochloric acid free from chlorine; coke reacts at 450° C. and active carbon at 350° C. The loss of chlorine with coke is about 2 per cent., with charcoal about 4 per cent., and with active carbon about 6 per cent. The ash in coke takes a catalytic part in the formation of hydrochloric acid, and equilibrium is reached in about three seconds. The acid obtained when coke is used is often clouded with separated sulphur as it leaves the condenser. At the temperatures employed no water gas is formed, and the total reacting carbon behaves according to the above equation. Nevertheless it seems that in practical operation some carbon monoxide is formed. The Great Western Electrochemical Co., of Pittsburg, uses a reaction tower filled with coke which is brought up to a red heat by passing hot air through it. When the temperature of the coke is sufficiently high, chlorine gas and steam are introduced at the bottom of the tower, and a temperature of about 900° C. is obtained in the tower, which can be maintained for months at a time.

Processes of this kind which are used industrially have been developed by Paulus, Hill and the Royal Baking Powder Co. (1922), as well as by Poma and Andreani (1923). In Italy, plants using the latter system are operated at Cesano Maderno by the Soc. Materie Coloranti Bonelli, and at Cengjo by the Soc. Italiane Prodotti Esplodenti. The latter plant is shown in the accompanying illustration and is quite simple. It consists of two reaction chambers, A, each of which carries a bed of coke about a metre in depth. At B is shown a pipe opening in which a small pipe is carried in a larger one with an annular space between. Gaseous chlorine is introduced by the outer pipe and the steam by the inner pipe.

Italian Results

The hydrochloric acid vapour leaves the reaction chamber by the openings at the top, and, after traversing a dust-separating chamber, goes to the condensing plant. These two chambers have a capacity for converting 2,000 kg. of chlorine gas into hydrochloric acid daily by the consumption of 400 kg. of coke. According to Aita and Molinari, the coke has approximately the following percentage composition: Moisture, 3·28; ash, 8·09, of which 0·94 is ferric oxide and 1·17 sulphur. The acid obtained has a gravity of 20·2° Bé. (1·165), containing



AN ITALIAN PLANT.

31·4 per cent. of hydrochloric acid, 0·08 per cent. sulphuric acid, 0·03 per cent. chlorine, 0·02 per cent. sulphur, and 0·13 per cent. of iron plus aluminium. The residue from evaporation was 0·40 per cent., which after calcination amounted to 0·18 per cent.

The following comparative statement of Italian production costs (in lire) naturally depends on the price of the chlorine, etc. It is given here to show relative rather than absolute costs. The figures are for the production of 100 kg. of 100 per cent. acid; (*a*) is the cost of producing acid from sodium chloride and sulphuric acid, and (*b*) is the cost of production by the coke process:—

(*a*)	Lire.
178 kg. Sea Salt ..	31·35
310 kg. H_2SO_4 (100%)	77·50
14 kg. Coal	2·25
Power, Water, etc. ..	0·75
Labour..	5·00
Repairs	1·90
Miscellaneous	1·85
	120·60
400 kg. Bisulphate ..	80·00
	40·60
Or 13·50 lire for 100 kg. 21° Bé. acid (33%).	

(*b*)	Lire.
102 kg. Electrolytic Chlorine	20·40
25 kg. Coke	6·30
Labour	5·00
Power, Steam, Water, etc.	1·50
Miscellaneous	1·15
	34·35
Or 11.45 lire for 100 kg. 21° Bé. acid (33%).	

As already mentioned, the coke process is considered to be the most profitable in the United States. The American patents thereon, Nos. 1,220,411, 1,229,509, and 1,485,816, are referred to in *Industrial and Engineering Chemistry*, 1920, p. 538, and 1925, p. 1,071. N. A. Laury, in *Hydrochloric Acid and Sodium Sulphate* (New York, 1927), p. 91, emphasises that the basic idea in the synthesis is to support the endothermic reaction between steam and carbon by the exothermic reaction between hydrogen and chlorine.

The above article is translated from an account in *Die Metallbörse*, 1928, No. 43, pp. 1182–1183, by Dr. B. Waeser.

Empire Marketing Board

Notes on Work and Finance

H.M. STATIONERY OFFICE has just published a White Paper entitled " Empire Marketing Board—Note on the work and finance of the Board, and statement of research and other grants approved by the Secretary of State for Dominion Affairs from July, 1926, to March 31, 1929 " (pp. 31, 9d.). Extracts of chemical interest are given below.

Low Temperature Storage Research

As regards research on low temperature storage, etc., the extensions at Cambridge and the erection of a cold store for trials on a semi-commercial basis at East Malling are proceeding. Investigations by the Department of Scientific and Industrial Research on the existing traffic conditions in the transport of Irish Free State dairy produce have finished and have led to the installation of experimental containers and vans, as well as to the initiation of a similar experiment by the Government of Northern Ireland.

Vitamins and Dairy Research

Research at the Lister Institute during the past year has been concerned with the fundamental investigations into the properties of vitamin C and its effects on nutrition, including a study of the behavious of the vitamin in cooking and fermentation. Work is also being done on dairy products in respect of their contents of vitamins A and D. Tests carried out on honey have demonstrated that this product is not a source of vitamins, and that this deficiency is not due to deterioration consequent on treatment or storage.

The grant to the National Institute of Research in Dairying, Reading, has been extended. Investigations into " red spot " in cheese have demonstrated that related problems require further investigation. Substantial progress has been made in the study of " fishiness " in butter. The survey of the utilisation of milk residues has been partially completed. A grant has been made to the University of British Columbia to assist research on cheese ripening processes. Steps have been taken to establish a *Journal of Dairy Research*, which will be published by the Cambridge University Press.

Fisheries

The investigations into the vitamin content, and methods of extraction and manufacture, of British cod liver oil have now concluded and have demonstrated that the oil is extremely rich in quality and vitamin content. The Department of Scientific and Industrial Research have carried out investigations into the preservation and transport of fish and have made preliminary arrangements for the erection of a small fish research station at Aberdeen. The investigations so far point the way to practical advances of economic significance in the matter of handling and stowage aboard fishing vessels. Two trawlers were operated from Aberdeen and Milford Haven, experimentally equipped for large scale trials designed to test the possibilities of maintaining the quality of fish caught.

Wool

In addition to the grants to the Animal Breeding Research Department, University of Edinburgh, and to the British Association for the Woollen and Worsted Industries, Leeds, a further grant has been made to enable an officer of the latter to tour the Dominions to investigate problems of wool production. This grant is being administered by the Department of Scientific and Industrial Research.

New Benn Publications

THE new publications announced by Ernest Benn, Ltd., include the following :—

Crusaders' Coast. By Edward Thompson, illustrated by C. E. Hughes. 10s. 6d. The author of *These Men Thy Friends* describes Palestine just before and after the end of the war.

An Expert in the Service of the Soviet. By M. Larsons. Translated by Dr. Angelo Rappoport. 10s. 6d. The first English edition of a book which has just been published in Germany. No other paid Soviet expert has yet been able to tell such a story as this.

Fuel. By Sir Richard Redmayne. Benn's Sixpenny Library No. 90.

Australian Chemical Merger

A £7,000,000 Enterprise

A PRELIMINARY account of the merger of four great Australian chemical companies, *i.e.*, the Mount Lyell Mining and Railway Co. Ltd., Cuming, Smith and Co. Pty. Ltd., Wischer and Co. Pty. Ltd., and Nobel (Australasia), Ltd., was recently given in these columns. Some further details are now available.

The nominal capital of the new enterprise is £7,000,000 in £1 shares. After adjustments have been completed with the companies associated with the new concern, the subscribed capital will be approximately £2,500,000, which represents the value of the assets taken over. The final capitalisation and apportionment of shares to each company and other details will probably be made known shortly. It is believed that each of the merging companies will become a holding company for the allotment made, and that shares will not be distributed to individual shareholders. The directors of the new concern have been selected from the directorates of the four firms concerned, and are Messrs. W. F. Cuming, Colin Templeton, A. A. Stewart, P. C. Holmes Hunt, Paul Wischer, and Sir Lennon Raws. Mr. W. F. Cuming is managing director and Mr. T. W. Haynes general manager.

Capacity

The capacity of the works embraced in the merger is 300,000 tons, but working output has been about 250,000 tons annually. The company will manufacture superphosphates and other chemical fertilisers. Some of the companies which are a party to the amalgamation have interests in fertiliser companies in Western Australia, South Australia, and New South Wales. Their holdings in Australian Fertilisers Pty. Ltd., also give them a direct interest in the Queensland company of A.F.C. and Shirleys Fertilisers, Ltd., as the Australian Fertilisers Co. holds a large portion of the Queensland company's shares.

Nobel (Australasia), Ltd. is one of the Australian connections of Imperial Chemical Industries, Ltd., whose other interests in Australia are :—Imperial Chemical Industries (Australasia), Ltd., Brunner Mond and Co. (Australasia) Pty. Ltd., Ammunition (Nobel) Pty. Ltd., Leathercloth Pty. Ltd., R. F. Higgs, Ltd., Australian Fertilisers Pty. Ltd., British Australian Lead Manufacturers Pty. Ltd., Standard Ammonia Company (Sydney), Ltd., Wallaroo-Mount Lyell Fertilisers, Ltd., Metal Manufacturers Pty. Ltd., Victoria Ammonia Co., Ltd., Consumers Ammonia Co. Ltd. and the Ammonia Co. of Sydney Ltd. The company is also associated with Kaikohi Development Ltd., of Auckland.

German Interests Abroad

Connections with External Chemical Industries

THE Diskonto-Gesellschaft of Germany has just published an account of the connections effected recently between German and other chemical companies. Some of the more interesting details of the period May-December, 1928, are as follows :—The Deutsche Solvaywerke have acquired the Werrawerke A.-G. (Buchenau) from the French St. Gobain group ; the I.G. has formed in Basle the Société Internationale pour Entreprises Chimiques (capital 20,000,000 Swiss francs) ; the German I.P. Bemberg Co. has an interest in the formation of British Bemberg, Ltd. ; with the collaboration of Vereinigten Glanzstoff-Fabriken of Elberfeld, the First Roumanian Artificial Silk Factory was founded ; the newly-formed Masa G.m.b.H. of Berlin has acquired the licence for nearly all Europe for the patents of the Oxford Varnish Co. (Detroit) ; with German participation, there has been formed at Glarus an international coal development company, the Compagnie Générale de Distillation et Cokéfaction à basse Température et Minière ; the Société Financière Internationale de la Soie Artificielle (capital 230 million francs) has invested in German artificial silk shares 58 per cent. of the 150 million francs which it has invested in artificial silk ; the Holzverkohlungsindustrie A.-G. of Constance, in conjunction with the Distillers Co., has erected in England a factory for the production of acetic acid and acetone ; the Verein für Chemische Industrie (Frankfurt-am-Main) and the Allgemeene Norit concern (of Amsterdam) have made a new sales agreement, which deals with the entire sale of active charcoal ; with German capital participation (2 million francs), there has been founded in Belgium the S.A. des Gaz Industrielles (Brussels), which will produce oxygen, nitrogen, etc.

Canadian Fertiliser Industry

Synthetic Ammonia Plant for British Columbia

THE Consolidated Mining and Smelting Co. of Canada has announced (it is stated in *Canadian Chemistry and Metallurgy*) that, during the next two years, it will spend between seven and eight million dollars on the erection of the first unit of a synthetic fertiliser plant, using by-products from its smelter, together with synthetic ammonia. The first unit, it is expected, will be completed in about two years.

The sulphuric acid will be made in a contact plant of 300 tons daily capacity, using sulphur dioxide from the roasting of zinc concentrate. A pilot plant of 35-ton capacity has been in operation since the beginning of this year and is said to have given complete satisfaction. The larger plant will be built on the same lines.

A plant for the liquefaction of air and separation of nitrogen therefrom, having a capacity of 39·2 tons of nitrogen daily, has been ordered. This will give the necessary nitrogen for either approximately 175 tons of ammonium sulphate or 260 tons of ammonium phosphate per day. Both salts of ammonia will be made. The hydrogen for the ammonia will be made by the electrolytic decomposition of water and will use 23,000 horse-power of electric energy. The whole plant will consume 30,000 horsepower of electric energy.

The superphosphate of lime and phosphoric acid will be made by treating the phosphate rock from the deposit of phosphate of lime that the company has developed near Fernie in the Crow's Nest Pass district, with sulphuric acid.

Mr. S. G. Blaylock, vice-president of and general manager for the company, has recently returned from three months in Europe, where he made a thorough investigation of the methods of manufacturing synthetic nitrogen products, and other technical experts of the company are now in Europe on a similar quest. Only 200 to 300 tons of liquid nitrogen are produced daily on the North American continent, and 3,000 tons per day are produced in Europe.

The sulphuric acid plant will be erected at the smelter and the remainder of the plant on the Warfield Flat, at Trail, where the company has its experimental farm. Eventually it is believed that the difficulty that has always existed at Trail, in connection with fumes from the smelters, will be largely obviated by the use of this gas in acid production.

Tin Discovery in British Columbia

CONSIDERABLE interest has been aroused by the discovery of stannite, a tin-bearing mineral, in a vein in the Snowflake deposit situated in the Revelstoke district of British Columbia. After making a brief examination of this property, in company with the consulting engineer of the Snowflake Mining Co., Dr. V. Dolmage, of the Geological Survey, Dominion Department of Mines, reports that the vein in which the stannite occurs is one of a number of large and persistent parallel quartz veins which can be traced for several miles along the steep mountain sides of this rugged district. It outcrops at elevations of 5,500 to 6,000 feet six miles north of a point on the main line of the Canadian Pacific railway twenty miles east of Revelstoke. The veins occur in black, highly carbonaceous, in places of graphitic, argillites. These are part of a thick series of quartzites, greenstones, argillites and limestones which occupy almost this entire region, and are part of a still larger group of metamorphosed rocks widely distributed in British Columbia and considered to be of Pre-cambrian age. The sediments are intruded by granitic rocks, and it is thought that these may have been the source of the solutions from which the minerals were deposited. In No. 1 vein on the Snowflake property, stannite is present in almost all the exposed parts of the vein where other sulphides such as pyrite, galena and zinc-blende are present, and in the newest workings extending from the long low-level tunnel it is very abundant. In a raise where the vein is four to seven feet wide the tin-bearing mineral is more abundant than any of the other sulphides except pyrite, and in places, it appears to constitute as much as 10 per cent. of the vein. In their composition and geological associations, the veins closely resemble those of Potosi, Bolivia. Both are in old slates or argillites associated with comparatively young granodiorites and granites, and the minerals found in one are almost the same as those found in the other.

Developments at Billingham

Shipping to be Speeded Up

FOLLOWING negotiations of some length, Synthetic Ammonia and Nitrates, Ltd., has purchased part of the property known as Graythorpes from Sir W. Gray and Co., West Hartlepool. The purchase involves the acquisition of land and harbour rights with an existing wharf which, when equipped with loading and discharging installation, will enable the Synthetic Co. to transport material and the produce of their works quickly and cheaply by steamers, a number of which are owned by Imperial Chemical Industries.

Nature of the Property

Seven years ago Sir W. Gray and Co. built an up-to-date shipyard and docks for repair work at Graythorpes, which is situated midway between Seaton Carew and Port Clarence. As this is a somewhat isolated location Sir W. Gray built a model village near the works to house his workpeople.

Originally the Synthetic Co., it is understood, desired to purchase the whole of Sir W. Gray's property at Graythorpes. Ultimately a compromise was decided on—Sir W. Gray and Co. to retain their shipyard and docks and the village, and the Synthetic Co. to purchase land alongside the shipyard, a wharf and right of way regarding transport. This development is likely to prove a great boon to Graythorpes, for Imperial Chemical Industries have a large interest in shipping and will probably be able to place a good deal of ship repair work with Sir W. Gray and Co.

A railroad already exists, which will enable traffic to pass from the Synthetic works at Billingham to the wharf at Graythorpes, but, should this prove inadequate for future requirements, it is understood that land has also been purchased to enable a private railroad to be installed direct from Billingham to the wharf side.

The Scope of the Works

The Synthetic Co.'s works cover an enormous area, and employ at present more than 10,000 people, engaged in all classes of trades, a large proportion being on constructional work, since the factory is in a continuous state of expansion.

Traffic movements at present average 900 trucks per day, so it is obvious how important is the latest move of the Synthetic Co., as it will tend to solve their transport difficulties.

The company is keenly interested in its workpeople's welfare and has at present under construction schemes costing £50,000. These include the provision of numerous sports fields, a club house and a welfare hall. By the end of September the company will have built for its workmen 1,300 houses at Billingham.

Fastness of Colours on Leather

THE Governors of the Leathersellers' Technical College, London, have provided facilities, at the request of the Federation of Curriers, Light Leather Tanners and Dressers, Inc., for a scholar to do research work upon the important problem of fastness of colour on leather. Mr. Royce Denyer, who was in attendance at the College during the sessions 1927-8 and 1928-9 as the holder of the Hepburn-Gale Scholarship, and who has just been awarded the Leathersellers' College Diploma in Leather Manufacture, has been appointed to undertake the work.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

134 (*Electric Furnace*).—The names are required of makers, or, if foreign, the agents in this country, of Trost Electric Furnaces, for the testing of silica bricks.

Appointments Vacant

CHEMIST, with experience in the manufacture of silk by the dry (acetate) process. Details on p. xviii.

CHEMICAL WORKS FOREMAN, experienced in organic processes. Details on p. xviii.

From Week to Week

FATAL INDUSTRIAL ACCIDENTS in July included 3 in chemical, etc., factories.

A PRIZE is being offered by the Fascist Association of Textile Fibre Producers for a new international name for artificial silk.

THE AUSTRIAN CHEMICAL INDUSTRY, according to the most recent data, consisted in 1927 of 21 companies, with a total capital of 35,246,000 schilling.

M. TOMSKY, the former president of the All-Russian Trade Unions, has been appointed head of the chemical section and a member of the Praesidium of the Supreme Economic Council of the U.S.S.R.

BRITISH BRIQUETTES, LTD., has been formed to effect an amalgamation of the briquette and patent fuel industry in South Wales and Monmouthshire. Details are given in our list of "New Companies Registered."

THE GRASSELLI CHEMICAL CO., of Cleveland, now a branch of E. I. du Pont de Nemours and Co., is erecting at Ecorse, Michigan, a sulphuric acid plant at a cost of 750,000 dollars. Nitric and hydrochloric acid plants will be added later.

A CONFERENCE will be held by the International Society of Leather Trades' Chemists at Prague, September 9-14. Information on the subject may be obtained from the hon. secretary of the British section, Mr. R. F. Innes, Room 105, Battersea Polytechnic, London, S.W.11.

THE MINISTER OF HEALTH and the Minister of Agriculture have appointed Mr. H. E. Brooks to be chairman of the Joint Advisory Committee on River Pollution, in succession to Sir H. Monro, who has resigned the chairmanship owing to his prospective absence abroad during the whole of the ensuing winter.

THE MEDAL of the Institution of Mining Engineers has been awarded to Mr. George S. Rice, Chief Mining Engineer, United States Bureau of Mines, Washington, "in recognition of his eminence in all matters relating to the safe working of coal mines and the well-being of mine-workers, with special reference to the practical application of scientific knowledge."

UNEMPLOYED INSURED PERSONS, at July 22, 1929, in the industry of chemicals manufacture in Great Britain, numbered 6,345; in explosives manufacture, 722; in paint, varnish, japan, red and white lead manufacture, 728; and in oil, grease, glue, soap, ink, match, etc., manufacture, 4,924. The percentages of insured persons unemployed at the same date in the same industries were 6·4, 3·6, 3·9 and 6·5 respectively.

THE ORIGINAL SCULPTURE of the well-known trade mark of The Limmer and Trinidad Lake Asphalt Co., Ltd., was stolen from the Burlington Galleries last week. The work, in bronze, was by Mr. P. Lindsey Clarke, and represented the figure of a man supporting a section of road, called "The Spirit of the Road." A curious point in connection with the theft was that a metal facsimile of the statue was substituted by the thief for the original, in order, it is supposed, to delay discovery.

RECENT WILLS INCLUDE: Dr. Charles Beavis, of Wick, near Bristol (net personalty £28,906), £29,075.—Mr. J.W. Knights, F.I.C., formerly public analyst for Cambridgeshire (net personalty £5,382), £5,955.—Mr. John Bairstow, of Burley Queen's Park, Chester, manufacturing chemist, a member of the Dee Conservancy Board and a director of the Chester Gas Co., £24,566.—Mr. Henry Cuming Harvey, of Edgbaston, retired manufacturing chemist (net personalty £92,551), £93,223.

THE BRITISH SWISS INTERNATIONAL CORPORATION have, it is understood, paid to the Government of the Union of South Africa the sum of £302,000, the estimated cost of the railway now in course of construction between Koopmansfortein and Postmasburg, Cape Province. In the same connection the Manganese Corporation (1929) has deposited with the Union Government securities of that Government totalling £100,000. The £400,000 working capital of the Manganese Corporation (1929) has been privately subscribed. The corporation was formed by the British Swiss International Corporation to develop the deposits of manganese at Postmasburg.

A NEW PRODUCT, dehydrated tartrate of lime, known as "supertartrate," and containing from 73 to 78 per cent. of tartaric acid, is now being produced from wine lees by the Société Industrielle de Languedoc at its Saint-Laurent-d'Aigouze plant. The Société Alsacienne des Produits Chimiques d'Alsace is installing at its Vaugouin plant, at Rochelle-Palice, equipment for the dehydration of ordinary tartrate, and its transformation into supertartrate. This ordinary tartrate will be furnished to the plant by a series of local plants which the company is installing in the departments of the Tarn, Aude and Pyrenées-Orientales for the extraction of tartrate from distillation residues. It is reported that the Société Industrielle de Languedoc is engaged in negotiations for the cession of its patents and processes abroad for the production of supertartrate; and in America, for the production of tartaric acid with supertartrate as a basis.

MAY AND BAKER, LTD., announce an advance of twopence per lb. in the price of English refined camphor.

THE ZINC OUTPUT of the Electrolytic Zinc Co. (of Australia) is to be increased to 65,000 tons per annum, the plant at Risdon, Tasmania, being extended for the purpose.

BRITISH IMPORTS OF PLATINUM from Germany in the first quarter of 1929 amounted to 602 kg., that is, about half the total German exports. Seventy per cent. was of Russian origin.

DISEASES OF OCCUPATIONS reported during July under the Factory and Workshop Act included 2 cases of aniline poisoning; and 6 cases of chrome ulceration (2 in the manufacture of bichromates, 1 in dyeing and finishing, and 3 in other industries).

MR. B. E. TODHUNTER, a director of Imperial Chemical Industries, Ltd., who has been on a visit to Australia and New Zealand in connection with the organisation and development of his company's Australasian interests, is returning to England via South Africa.

ACCIDENTAL DEATH was the verdict returned at the inquest, on Tuesday evening, on George Redfern, of Kibblesworth, a caster at the Castner Kellner Alkali Co.'s works, Wallsend, who died as a result of burns received when carrying sodium sticks, which fell and ignited, setting fire to his clothing.

F. W. BERK AND CO., chemical manufacturers, announce the purchase of a plant site in New Jersey, U.S.A. It is understood that the company intends to erect a plant in the United States and that its business there will be conducted by F. W. Berk and Co., of Baltimore, incorporated about three months ago.

THE AMERICAN CYANAMID CO. is enlarging its plant, at a cost of 4 million dollars. The annual production of cyanamide at Niagara Falls is to be increased by 100,000 tons to 355,000 tons. The extension of the company's Ammo-Phos works at Warners, New Jersey, will increase production by 48,000 tons per annum.

AT THE FINAL SESSION of the International Advertising Convention at Berlin on Thursday, August 15, Sir Ernest Benn, on behalf of the British delegates, expressed thanks for the hospitality accorded to the delegates and made a presentation of a painting. Loud applause greeted the announcement that a telegram had been sent to Dr. Eckener wishing him a successful voyage and informing him that the Convention had interrupted its meeting to watch the Graf Zeppelin pass over Berlin.

THE NATIONAL RESEARCH COUNCIL of Canada has appointed Professor G. S. Whitby to direct the operations of its industrial chemistry division. Professor Whitby is head of the department of organic chemistry at McGill University. He is a past-president of the Canadian Institute of Chemistry and also of the Canadian Chemical Association. He holds the Colwyn Medal of the Institute of the Rubber Industry for researches in rubber, and is the author of several standard works on rubber, and a great many papers on organic chemistry.

THE INTEGRA CO., LTD., of 183, Broad Street, Birmingham (sole agents for the Leeds and Northrup Co., Philadelphia), inform us that they have recently received an order from Henry Ford and Son, Ltd., of Cork, in respect of 24 L. & N. potentiometer recorders, fitted with signalling lamps and deviation indicators, which are to be used for the temperature control of the heat treatment plant. The signalling lamps and deviation indicators will be installed in front of each furnace. The deviation indicator will show the operators how many degrees they depart from the correct temperature. The panel of three signalling lamps—red, white, blue—will give a five-light combination; high, normal and high, normal, normal and low, low. The recorders will be located in the metallurgist's office, at a long distance from the heat treatment shop. The Integra Co., Ltd., have also received an important order from The Petroleum Refineries, Ltd., for four 6-point L. & N. potentiometer recorders, two 4-point L. & N. potentiometer recorders, and one double-range wall type L. & N. indicator, with the necessary push button switch. This equipment will be used in connection with The Petroleum Refineries' new cracking plant, which is being installed at Killingholme.

Obituary

MR. ADOLPH HOEGGER, a prominent Manchester business man, for many years chairman and joint managing director of the British Cotton and Wool Dyers' Association.

MRS. BYTHWAY, aged 76, widow of Mr. Thomas Bythway, chemical merchant, of Manchester and Southport. Mrs. Bythway endowed a £1,000 bed in Leigh Infirmary in memory of her only son, who died during the war on active service. She also endowed a chemical scholarship at Manchester University.

MR. FREDERICK MOORE, in his sixtieth year, on May 31, at Victoria, B.C. Mr. Moore was a graduate of the University of London, and went to Victoria some 35 years ago. With Col. J. A. Hall and John Fisher he established the Victoria Chemical Works, which, in 1912, was taken over by the Canadian Explosives Co., Mr. Moore being made manager for Western Canada. He was later placed in charge of the explosives plant on James Island. Mr. Moore retired from active work about nine years ago.

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Vitamins and other constituents of citrus oils and related products. S. G. Willimott. *Perfumery and Essential Oil Record*, August, pp. 270–275.

GENERAL.—Composition of acetylene black with gas black and lamp black. T. R. Dawson and W. H. Hartshorn. *Trans. Inst. Rubber Ind.*, June, pp. 48–70.

The ageing of cotton contained in rubber goods. G. Barr. *Trans. Inst. Rubber Ind.*, August, pp. 31–47.

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OILS AND FATS.—The differential halogen absorptions of oils and fats. J. W. Croxford. *Analyst*, August, pp. 445–453.

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ANALYSIS.—Olive oil analytical method. II. The use of the ultraviolet ray in the detection of refined in virgin olive oil. S. Musher and C. E. Willoughby. *Oil and Fat Industries*, August, pp. 15–16.

APPARATUS.—A new differential pressure gauge. A. R. Olson and L. L. Hirst. *J. Amer. Chem. Soc.*, August, pp. 2378–2379.

An inexpensive Pyrex conductivity cell. W. B. Campbell. *J. Amer. Chem. Soc.*, August, pp. 2419–2420.

FATS.—American reindeer fat. W. F. Baughman, G. S. Jamieson, and R. S. McKinney. *Oil and Fat Industries*, August, pp. 11–12.

INORGANIC.—The preparation of anhydrous hydrogen iodide. R. T. Dillon and W. G. Young. *J. Amer. Chem. Soc.*, August, pp. 2389–2391. Concentrated hydriodic acid is dropped upon phosphorus pentoxide, and the gaseous HI generated purified by bubbling through saturated calcium iodide, drying over phosphorus pentoxide and cooling to —30° C.

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ORGANIC.—The sulphonation of phenanthrene. I. A new monosulphonate. L. F. Fieser. *J. Amer. Chem. Soc.*, August, pp. 2460–2470. Phenanthrene-1-sulphonic acid has been found among the products of low temperature sulphonation, and various derivatives, including 1-hydroxy-9:10-phenanthrenequinone and 1:4-phenanthrenequinone, have been prepared from it.—II. Disulphonation. *Ibid.*, pp. 2471–2486.

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The micro-determination of phosphates. F. Holtz. *Biochemische Zeitschrift*, Vol. 210, Parts 1–3, pp. 252–260.

APPARATUS.—New gas-collecting and gas-measuring apparatus. B. Kunisch. *Chemische Fabrik*, August 14, pp. 372–373.

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ENZYMES.—New views on the specificity and the mechanism of action of the sugar-splitting enzymes. R. Weidenhagen. *Zeitschrift angewandte Chem.*, August 17, pp. 833–835.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

315,813. Recovery of Organic Acids from the Oxidation Products of Paraffin Hydrocarbons, Waxes, etc. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application dates, March 16 and October 22, 1928.

Complete saponification of the acid oxidation products of paraffin hydrocarbons, waxes, etc., is effected with alkaline earths, including magnesia, in aqueous suspension. The salts are separated from the aqueous layer containing impurities and the saponified mixture dried and extracted with benzene. The extracted salts are decomposed by sulphuric or carbonic acid, with or without wetting agents and pressure, and the acid constituents in the oxidation product are thus obtained in a quantitative yield free from unsaponifiable materials. Some examples are given.

315,892. Monocarboxylic Acids, Production of. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 17, 1928. Addition to 262,101. (See The Chemical Age, Vol. xvi, p. 144.)

In the conversion of dicarboxylic acids or anhydrides into mono-carboxylic acids by passing the vapours over catalysts capable of splitting off carbon dioxide according to specification 262,101 (see The Chemical Age, Vol. XVI, p. 144), the efficiency of the catalyst diminishes. This is avoided by purifying the materials from sulphur compounds by first passing them over granulated pumice, silica gel, active carbon, etc., at such a temperature that no condensation occurs. A particularly suitable purifier is the catalyst which has already been used, but has lost its efficiency although still capable of absorbing sulphur compounds. Alternatively, the purification may be applied to the initial materials from which the dicarboxylic acids or anhydrides are obtained, *e.g.*, to crude naphthalene used for the production of phthalic anhydride.

315,895. Unsaturated Hydrocarbons, Manufacture of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 16, 1928.

Mineral oils, tars, tar fractions, etc., are cracked at 600°–800° C. with or without water vapour, and catalysts such as silicates alone or with chromium oxide or molybdenum oxide. The resulting gases contain about 20–34 per cent. of ethylene, 4–12 per cent. of propylene, and 1–5 per cent. of butylene and amylene, the residue being methane, hydrogen, carbon monoxide, and nitrogen. The gases are heated and passed under pressure over copper to remove acetylene, and the benzines are liquefied. The remaining hydrocarbons are separated by fractionating into permanent gases, ethylene, and propylene. An example is given of the treatment of American gas oil.

315,900. Catalytic Reactions. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 13, 1928.

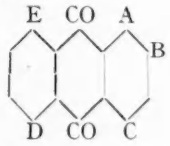
Catalytic reactions employing hydrogen under pressure are carried out more effectively if the catalyst is first exposed to rays of high frequency in the presence of inert gases or similar gases to those subsequently treated. In an example an iron catalyst for ammonia synthesis is treated at 500°–600° C. and 180 atmospheres pressure with a nitrogen-hydrogen mixture for 24 hours. The catalyst is then subjected to Röntgen rays for 24 hours, and may then be used for ammonia synthesis, when it gives substantially larger yields.

315,904. Titanium Pigments, Manufacture of. B. Laporte, Ltd., Luton, I. E. Weber, St. Kilda, Cumberland Road, Leagrave, Beds., and A. N. C. Bennett, 27, Dane Road, Luton. Application date, April 17, 1928.

The object is to increase the proportion of barium sulphate which can be added to titanium oxide without affecting the covering power. Titanium oxide is precipitated from titanium sulphate and is dispersed by hydrochloric or nitric acid, barium nitrate, barium chloride, or strontium chloride. Barium sulphate is added in sufficient quantity to obtain a final product containing 70 per cent. $BaSO_4$ and 30 per cent. TiO_2, and barium carbonate is added to coagulate the mass. The barium sulphate may be made *in situ*.

315,905. Dyes of the Anthraquinone Series. Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1., A. Shepherdson, and W. W. Tatum, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, April 19, 1928.

These anthraquinone derivatives contain in position 1 an amino or alkylated amino group, and in position 4, 5 or 8 a *p*-amino-anilino group. A halogen may be present in position 2 or may be replaced by a sulphonic group. The unsulphonated compounds dye cellulose esters or ethers green shades and the sulphonated compounds are dyes for wool, silk, and immunised cotton. The products are made by condensing *p*-phenylene-diamine with an anthraquinone derivative of the formula



where A represents an amino or alkylated-amino group, B represents hydrogen or halogen, and of C, D, and E, two represent hydrogen and one halogen. Compounds containing halogen in position B may be treated with a soluble sulphite to introduce a nuclear sulphonic group. Instead of *p*-phenylene diamine, the corresponding monoacylated compounds may be used, the acyl group being subsequently removed by hydrolysis. Examples are given of the preparation of 1-methylamino-4-(*p*-amino-anilino) anthraquinone, 2-bromo-1-amino-4-(*p*-amino-anilino) anthraquinone, and other compounds.

315,910. Sulphur Dyestuffs, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 20, 1928.

Reddish brown sulphur dyestuffs are obtained by melting binaphthylene dioxide with sulphur at temperatures varying from 240° C to 300° C. according to the shade desired. Alternatively, sulphur dichloride may be used, sulphur being added in the later stages. A solvent or diluent may also be added. The products are soluble in sodium sulphide solution.

315,911. Condensation Products of the Anthraquinone Series, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 20, 1928.

Primary amino anthraquinones or derivatives or substitution products are treated with alcoholic alkali at a temperature below 100° C., preferably in the presence of an oxidising agent. The products differ from those obtained by alkali fusion, and do not exhibit pronounced vat dyestuff character, but possess a strong individual colour. They are applicable as intermediates in the manufacture of dyestuffs. Examples are given of the treatment of 1-aminoanthraquinone, 2-aminoanthraquinone, and 1-aminoanthraquinone-2-sulphonic acid.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention:—287,924 (A. Boehringer) relating to tetrazoles, see Vol. XVIII, p. 516; 288,554 (I.G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs, see Vol. XVIII, p. 555; 288,983 (I.G. Farbenindustrie Akt.-Ges.) relating to azo dyestuffs capable of after-treatment with metallic salts, see Vol. XVIII, p. 581; 297,726 (Rubber Service Laboratories Co.) relating to vulcanization of rubber, see Vol. XIX, p. 519; 298,090 (Soc. of Chemical Industry in Basle) relating to unsaturated hydrocarbons, see Vol. XIX, p. 543; 298,236 (Compagnie

Internationale pour la Fabrication des Essences et Pétroles) relating to hot purification of gases, see Vol. XIX, p. 543; 298,556 (Electro Metallurgical Co.) relating to thermal decomposition of hydrocarbons, see Vol. XIX, p. 565; 300,250 (Barber Asphalt Co.) relating to a metallic alloy, see Vol. XX, p. 15 (Metallurgical Section); 304,640 (Selden Co.) relating to catalytic preduction and hydrogenation of organic nitrogen compounds, see Vol. XX, p. 320.

International Specifications Not Yet Accepted

313,612. FERTILISERS. Soc. d'Etudes Scientifiques et d'Entreprises Industrielles, Ougrée, Belgium. International Convention date, June 15, 1928.

Phosphates are treated with nitric acid or oxides of nitrogen, and the free acid is neutralised by a neutral or alkaline salt of an alkali or alkaline earth metal, such as carbonates, bicarbonates, phosphates, sulphates or silicates, or substances containing these, such as gypsum, metallurgical slags, blast furnace slag, limestone, phosphatic chalk, etc.

313,617. AMINO ALCOHOLS. A Skita, 2, Lortzingstrasse, Hanover, and F. Keil, 10, Roonstrasse, Hanover, Germany. International Convention date, June 15, 1928.

Oxy-carbonyl compounds, polyoxy-carbonyl compounds, or poly-carbonyl compounds are hydrogenated catalytically in the presence of ammonia or an amine to obtain amino alcohols. In the first two cases, the carbonyl group alone reacts with the ammonia or amine, but in the last case only one carbonyl group so reacts, and the remainder is reduced to the alcohol stage. Thus, N-cyclo-hexylamino-(2)-propanol-(1) is obtained from oxyacetone and cyclohexylamine, and several other examples are given. The products are used for therapeutic purposes.

313,859. FERTILISERS. Soc. d'Etudes Sceintifiques et d'Entreprises Industrielles, Ougrée, Belgium. (Assignees of E. Voituron, Sclessin, Ougrée, Belgium.) International Convention date, June 16, 1928.

Tricalcium phosphate is treated with nitric acid or oxides of nitrogen, and the mixture of monocalcium phosphate and calcium nitrate is treated with an alkali diabasic phosphate sufficient to neutralise the free acid and convert the salts into dicalcium phosphate and the monobasic phosphate and nitrate of the alkali.

313,877. UNSATURATED ESTERS. Rohm and Haas Akt.-Ges., 42, Weiterstadterstrasse, Darmstadt, Germany. International Convention date, June 18, 1928.

These esters are obtained by heating β-hydroxy nitriles or their derivatives such as amides or β-alkyloxy compounds with alcohols and dehydrating agents in an acid medium. Acrylic acid ester is described.

313,887. DYES AND INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 18, 1928.

Vat dyes are obtained by condensing a naphthoylene-aryl-imidazol-peri-dicarboxylic acid or its anhydride with an *o*-diamine or a salt in the presence or absence of glacial acetic acid or nitrobenzene. The starting substances are made by treating the naphthoylene-arylimidazol-mono- or di-alkylindandiones with alkali and oxidising the naphthoyl-ene-arylimidazol-4-alkyl-acetyl-5-carboxylic acids with potassium manganate or sodium bichromate.

313,919. INDIARUBBER. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 19, 1928.

Rubber is treated with an alkyl or aryl sulphur halide or derivative in the presence of an indifferent solvent.

313,927. DYES AND INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 19, 1928.

2-Chloro-4-amino-1-methylbenzene-6-sulphonic acid is made by sulphonating 2-chloro-4-nitrotoluene and reducing. It is diazotised and coupled with resorcinol or its derivatives or 1 : 3-dioxynaphthalene to obtain monoazo dyes which give yellow shades on chrome leather.

313,963. DESTRUCTIVE HYDROGENATION. J. Fohlen, 67, Rue de Rome, Paris. International Convention date, June 20, 1928.

Fuel or other carbonaceous material is treated with nascent hydrogen under a pressure of 5–180 atmospheres and at a temperature of 200°–1,000° C. Water may be used as the source of nascent hydrogen. An example is given of the treatment of shale oil to obtain 50 per cent. of light oil of density 0·85 distilling below 200° C. and 42 per cent. of oil of density 0·87 distilling between 200° and 300° C.

314,019. SYNTHETIC DRUGS. A. Boehringer, 75, Bingerstrasse, Nieder-Ingelheim-on-Rhine, Germany. International Convention date, June 21, 1928. Addition to 312,919. (See THE CHEMICAL AGE, Vol. XXI, p. 114.)

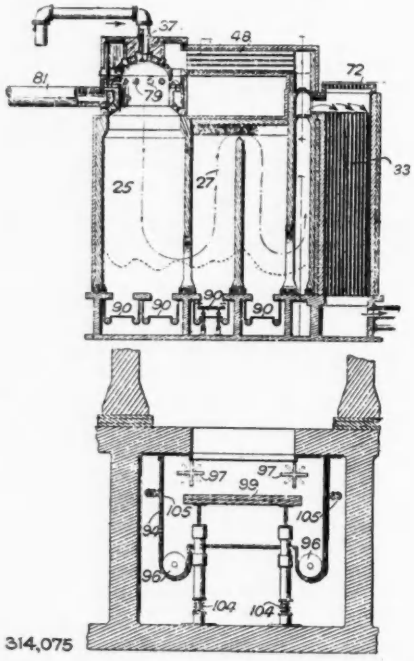
Pyridine and piperidine derivatives containing the group $CH_2CO.R$ in the α-position or in the α : α^1-positions are catalytically hydrogenated, so that one or both of the ketone groups is wholly or partly reduced, and or the pyridine nucleus or one or both of the carboxylic residues, where R represents such, is hydrogenated. In an example, α : α^1-diphenacetyl-pyridine hydrochloride is treated with hydrogen to obtain α-phenyl-hydroxyethyl-α^1-phenylethyl-pyridine and then α : α^1-diphenyl-ethylpyridine.

314,020. ANTHRAQUINONE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 21, 1928.

An anthraquinone-β-aldehyde is treated with water, an alcohol, or a phenol, in the presence of an alkali cyanide, and the leuco compound thus obtained oxidised to obtain anthraquinone-β-carboxylic acids and esters. A number of examples are given.

314,075. FERRIC OXIDE AND CHLORINE. Sulphur and Smelting Corporation, 54, Wall Street, New York. (Assignees of E. W. Wescott, 320, Buffalo Avenue, Niagara Falls, N.Y., U.S.A.) International Convention date, June 22 1928.

Dispersed or vaporised ferric or ferrous chloride is burnt with air at 830°–900° C. to obtain a coarsely crystalline oxide. The air may be preheated by the issuing gases which contain



314,075

chlorine. Ferric chloride is preferably volatilized at 325°–500° C. under pressure by using a vapour column 20–30 feet high.

Ferric chloride vapour is supplied through a pipe 37, and preheated producer gas through a pipe 81 and tangential nozzles 79 to a reaction chamber 25. Air is preheated by passing through a regenerator and is then drawn in through annular passages surrounding the nozzles 79. The gases pass to a baffled settling chamber 27 having a discharging device 90 for ferric oxide. Chlorine passes through the regenerator

33, and valves are provided to admit chlorine and air alternately through the two chambers of the regenerator. The device for removing ferric oxide comprises an airtight casing 94, screw conveyors 96, star wheels 97 co-operating with a table 99, which is mounted on springs 104, to control the rate of discharge. Air is supplied through pipes 105 to displace chlorine.

314,028. Dye Intermediates. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, June 21, 1928. Addition to 267,164. (See The Chemical Age, Vol. XVI, p. 468.)

Anthraquinone isoxazoles are treated with an alcohol or a phenol in the presence of potassium cyanide or sodium methylate, to obtain *o*-aminoanthraquinone carboxylic acid esters.

314,035. Monocarboxylic Acids. Selden Co., McCartney Street, Pittsburg, U.S.A. (Assignees of A. O. Jaeger, 9, North Grandview Avenue, Crafton, Pa., U.S.A.) International Convention date, June 23, 1928.

Phthalic anhydride and other polycarboxylic acids and their derivatives are converted into monocarboxylic acids by passing over catalysts which tend to split off carboxy groups in the presence of hydrogen, reducing gases or vapours such as methyl alcohol or methyl formate. The manufacture of a large number of catalysts is described, including porous substances, base exchange bodies, rare earth oxides, hydrogenation catalysts, etc. The treatment of phthalic anhydride to obtain benzoic acid is described.

314,060. Carbon Bisulphide. H. Oehme and Chemische Fabrik Kalk Ges., 1, Kalker Hauptstrasse, Kalk, near Cologne, Germany. International Convention date, June 23, 1928.

Ammonium sulphide or gas liquor obtained from coal gas is heated to obtain sulphuretted hydrogen, which is then passed over incandescent carbon to obtain carbon bisulphide. The remaining gas (about 30 per cent.) is absorbed in ammoniacal liquor, and the sulphuretted hydrogen then recovered again.

Latest Notifications.

316,966. Process of producing barium sulphide. Kali-Chemie Akt.-Ges. August 7, 1928.

317,040. Manufacture of sodium sulphite or bisulphite solutions. Zellstofffabrik Waldhof, and Faust, O. August 9, 1928.

316,950. Manufacture of derivatives of naphthazarin. I.G. Farbenindustrie Akt.-Ges. August 4, 1928.

316,951. Process for the manufacture of condensation products from olefines. I.G. Farbenindustrie Akt.-Ges. August 4, 1928.

316,987. Process for the manufacture of complex borofluoro organic acids and salts thereof. I.G. Farbenindustrie Akt.-Ges. August 7, 1928.

317,019. Process for treating fibrous materials. Soc. of Chemical Industry in Basle. August 8, 1928.

317,296. Process for the manufacture of ether derivatives of the amino benzoic acid alkamine esters. Schering-Kahlbaum Akt.-Ges. August 10, 1928.

Specifications Accepted with Date of Application

286,227. Substantive trisazo dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. February 28, 1927.

294,583. Azo-dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. July 26, 1927.

298,907. Azo-dyestuffs, Manufacture of. O. Y. Imray. October 13, 1927. Addition to 296,473.

302,175. Hydroxythionaphthenes, and vat dyestuffs therefrom, Manufacture of. I.G. Farbenindustrie Akt.-Ges. December 8, 1927. Addition to 284,288.

316,597. Alcohol and glycerine, Production of—by fermentation. A. H. Marks and P. Russell. (*E. I. Du Pont de Nemours and Co.*) April 27, 1928.

316,600. Conversion of heavy into light hydrocarbon oils. A. H. Marks and P. Russell. (*Deutsche Erdol Akt.-Ges.*) April 30, 1928.

316,637. Hydrocarbons of high boiling point into others of low boiling point, Process for the conversion of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 26, 1928.

316,647. Alkali cyanides, Process for the manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 2, 1928. Addition to 301,565.

316,648. Compounds containing active oxygen, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 2, 1928.

316,691. Stable diazo compound, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 8, 1928.

316,692. Vulcanization of rubber. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 8, 1928.

316,693. Betaine thiocyanate, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 8, 1928.

316,702. Alloys. R. Walter. May 11, 1928.

316,703. Separation, isolation, and purification of aromatic hydroxyacids. Graesser-Monsanto Chemical Works, Ltd., and D. P. Hudson. May 12, 1928.

316,735. Dilute nitrous gases, Process for the absorption of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 13, 1928.

316,750. Ketones, Manufacture of. Boot's Pure Drug Co., Ltd., and J. Marshall. July 6, 1928.

316,761. Condensation products of α-naphthylamine and acetaldehyde. Manufacture of—and the application thereof in the manufacture of vulcanized rubber. Clayton Aniline Co., Ltd., and R. Robinson. July 20, 1928.

316,847. Complex metal compounds of azo dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 24, 1928. Addition to 310,343.

Applications for Patents

Bhaduri, A. Process for production of aluminium hydroxide gel. 24,826. August 14.

Brightman, R. Azo dyestuffs. 24,971. August 15.

British Glues and Chemicals, Ltd. Extracting glue, etc., from leather. 25,182. August 17.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Dyeing, etc., textile fibres. 24,747. August 13.

—— Manufacture of barbituric acid derivatives. 24,842. August 14.

—— Process of manufacturing dyestuff preparations. 24,843 August 14.

Coley, H. E. Reduction of zinc from ores, etc. 25,064. August 16

Du Pont de Nemours & Co., E. I. Trisazo dyes. 24,368. August 9. (United States, August 28, 1928.)

Ges. für Linde's Eismaschinen Akt.-Ges. Purifying coke oven gas. 23,981. August 6. (Germany, August 6, 1928.)

Gibbs, W. E. Refining sodium chloride. 24,224. August 8.

Goodyear Tire and Rubber Co. Antioxidant or age-retarder for rubber. 24,056. August 6. (United States, November 26, 1928.)

—— Manufacture of thiazoles. 24,319. August 8. (United States, November 26, 1928.)

Groves, W. W., and I.G. Farbenindustrie Akt.-Ges. Fixing layers containing basic dyestuffs. 24,725. August 13.

Heyl, G. E. Production of activated carbon, etc. 24,806. August 14.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of conversion products of rubber. 24,017. August 6.

—— Manufacture of hydrogen peroxide compounds. 24,018. August 6.

—— Manufacture of artificial masses. 24,019. August 6.

—— Apparatus for manufacture of water-gas. 24,020. August 6.

—— Production of acetylene and hydrogen in electric arc. 24,175. August 7.

—— Production of wetting, etc., agents. 24,176, 24,177, 24,178, 24,179. August 7.

—— Production of dyestuffs. 24,180, 24,181. August 7.

—— Production of substitution products of dibenzopyrenequinones. 24,232. August 8.

—— Production of derivatives of monoamino-dibenzopyrenequinones. 24,302. August 8. (October 8, 1928.)

—— Production of vat dyestuffs. 24,303. August 8.

—— Manufacture of nitrogenous derivatives of pyranthrone. 24,406. August 9. (October 9, 1928.)

—— Manufacture of vat dyestuffs. 24,407. August 9.

—— Apparatus for carrying out distillation processes. 24,408. August 9.

—— Electrical apparatus. 24,409. August 9.

—— Manufacture of artificial materials. 24,410. August 9.

—— Manufacture of articles from plates of mica. 24,411. August 9.

—— Manufacture of substitutes for glass. 24,412. August 9.

—— Separation of ammonia from gas mixtures. 24,523. August 10. (April 8.)

—— Polymerisation of unsaturated organic compounds. 24,614. August 12.

—— Manufacture of substances for incorporation with rubber, etc. 24,615. August 12.

—— Manufacture of highly-active catalysts. 24,616. August 12.

—— Manufacture of optical metal mirrors. 24,617. August 12.

—— Manufacture of condensation products. 24,618. August 12.

—— Manufacture of artificial compositions and binding agents. 24,619. August 12.

—— Manufacture of plastic polymerisation products of diolefines. 24,681. August 13. (April 26, 1928.)

—— Manufacture of plastic polymerisation products of diolefines. 24,682. August 13. (August 27, 1928.)
—— Fixing layers containing basic dyestuffs. 24,725. August 13.
—— Dyeing, etc., textile fibres. 24,747. August 13.
—— Manufacture of barbituric acid derivatives. 24,842. August 14.
—— Process of manufacturing dyestuff preparations. 24,843. August 14.
—— Apparatus for spraying liquids into drops. 24,935. August 15.
I.G. Farbenindustrie Akt.-Ges. and Mond, A. L. Improving fatigue strength of metal workpieces. 24,968. August 15.
—— Oxidation of ammonia. 25,160. August 17.
—— Cleansing-agents. 25,161. August 17.
—— Polymerisation of diolefines. 25,162. August 17.
I.G. Farbenindustrie Akt.-Ges. Manufacture of derivatives of naphthazarin. 24,010. August 6. (Germany, August 4, 1928.)
—— Manufacture of disazo-dyestuffs. 24,011. August 6. (Germany, August 13, 1928.)
—— Manufacture of condensation products from olefines. 24,040. August 6. (Germany, August 4, 1928.)
—— Manufacture of basic products. 24,145. August 7. (Germany, August 13, 1928.)
—— Manufacture of complex-borofluoro organic acids, etc. 24,191. August 7. (Germany, August 7, 1928.)
—— Anæsthetics. 24,603. August 12. (Germany, August 13, 1928.)
—— Manufacture of dischargeable dyeings on acetate silk. 24,746. August 13. (Germany, August 13, 1928.)
—— Preparation of anhydrous magnesium chloride. 25,026. August 16. (Germany, October 4, 1928.)
—— Manufacture of vat dyestuffs. 25,085. August 16. (Germany, August 27, 1928.)
Imhausen, A. Manufacture of soap. 24,268. August 8.
Imperial Chemical Industries, Ltd. Manufacture of thermoplastic products from fatty oils. 24,445. August 9.
—— Destructive hydrogenation. 24,659. August 13.
Imperial Chemical Industries, Ltd., Riley R., and Powell, S. W. Purification of synthetic *n*-butyl alcohol. 24,662. August 13.
—— Production of acetaldehyde from acetylene. 24,694, 24,695. August 13.
—— Manufacture of cellulose derivatives. 24,857. August 14.
Imperial Chemical Industries, Ltd., and Stewart, A. Manufacture of pigments for colouring rubber. 24,970. August 15.
Jurling, J. G., and Naamlooze Vennootschap Fabriek van Chemische Produkten. Manufacture of acetyl-cellulose. 24,285. August 8.
Kleim, M. Chemical container. 24,417. August 9.
Lant, R. Storage of organic liquids. 24,438. August 9.
Loveluck, R. J., Scottish Dyes, Ltd., Thomas, J., and Thomson, R. F. Production of anthraquinone derivatives. 24,437. August 9.
McGougan, J. Concentrating phosphoric acid. 24,677. August 13
Meyer, F. W. Reactivating, etc., carbon. 24,267. August 8. (Germany, August 8, 1928.)
Naugatuck Chemical Co. Treatment of latex. 24,186. August 7. (United States, October 5, 1928.)
Pless, Hans Heinrich XV, Prince of. Distillation of fine coals. 24,597. August 12. (Germany, July 4.)
Rheinische Kampfer Fabrik Ges. Production of 1·8-cineol. 24,297. August 8. (Germany, August 21, 1928.)
—— Process for catalytic alkylation of compounds, etc. 24,298. August 8. (Germany, September 17, 1928.)
Schering-Kahlbaum Akt.-Ges. Manufacture of derivatives of amino benzoic acid alkamine esters. 24,601. August 12 (Germany, August 10, 1928.)
Seifer, T. Distilling, etc., oils, etc. 24,032. August 6. (June 28, 1928.)
Selden Co. Oxidation of acenaphthene. 25,058, 25,087. August 16. (United States, September 7, 1928.)
Smith, S., and Wellcome Foundation, Ltd. Preparation of digitalis glucoside. 24,236. August 8.
Soc. Chimique de la Grande-Paroisse Azote et Produits Chimiques and Soc. L'Air Liquide, Soc. Anon pour l'Etude et l'Exploitation des Procédés, G. Claude. Removal of sulphurous compounds from gases. 24,185. August 7. (France, August 8, 1928.)
Soc. d'Electro-Chimie d'Electro-Métallurgie et des Aciéries Electriques d'Ugine. Extraction of tin from ores, etc. 24,447. August 9. (France, June 22.)
Taylor, Sir T. Treatment of sulphur, etc. 24,082. August 7.
Temple, C. G. Wodehouse-. Production of carbonaceous products. 24,026. August 6.
Verein für Chemische Industrie Akt.-Ges. Saponification of cellulose-acetate solutions. 24,325. August 8. (Germany, August 11, 1928.)
Werner, K. Production of cellulose fatty acid esters. 24,962. August 15.

Applications of Tin

Comprehensive Plan of Research

A COMPREHENSIVE plan of research into the industrial applications of tin, including its properties as a preventive of corrosion and its economic use in the production of more efficient high-speed machine-bearings, was announced on Saturday by the hon. secretary of the Tin Industrial Applications Committee. The Committee was recently formed, in direct co-operation with the British Non-Ferrous Metals Research Association, to investigate the properties of tin, with a view to standardising its most efficient applications for industrial purposes and to finding new uses for the metal.

"We feel," the hon. secretary stated in an interview, "that the line of investigation now being undertaken will develop a new and successful preventive of corrosion. The research into bearing metals is of equal, if not greater, importance, since the efficiency of all engines is dependent upon them. Researches are being undertaken in several other directions. The commercial value of such research is well illustrated by a recent discovery. It has been found that by mixing a small amount of tin with lead and adding a smaller quantity of another non-ferrous metal the strength of the lead was increased enormously, as was its resistance to corrosion and cracking. This new alloy will mean the saving of many hundreds of thousands of pounds a year to the electrical industry and the building trades."

Since the formation of the Tin Industrial Applications Committee was announced a few weeks ago inquiries and applications for membership have been received from almost every part of the world. American and British industries using tin are taking an active interest. The committee is in close touch with many of the principal United States tin-consuming industries.

Payment of Wages for Holidays

AN account is given in *The Ministry of Labour Gazette* for August of agreements existing in various industries making provisions for holidays with pay. These include the following:—Heavy chemical manufacture (except London), 1 week (qualifying service 12 months); explosives trade, 3 days (qualifying service 6 months) and 1 week (qualifying period 12 months); paint, colour and varnish manufacture, 3 days, 5 days and 1 week respectively (qualifying periods 6, 9, and 12 months); cement manufacture, 1 week (qualifying period 12 months), match manufacture, 1 week (qualifying period 6 months); drug and fine chemical manufacture, 6 days (qualifying period 12 months). These are all general agreements. In the heavy chemical, explosives and cement industries, no payment is made in respect of public holidays to those not called upon to work. In the heavy chemical and drug and fine chemical industries, a *pro rata* holiday is allowed to workers with service of less than the amount specified. District agreements include the following:—Chemical workers, London, 3 days and 1 week respectively (qualifying periods 6 and 12 months); chemical and fertiliser workers, Plymouth, 1 week (no payment in respect of public holidays to those not called upon to work).

New Lignite Briquetting Industry in Saskatchewan

ACCORDING to the *Regina Leader* a number of prominent financiers and colliery operators have organised a company for the manufacture of lignite briquettes in the Souris Valley, South Saskatchewan. The company, incorporated under the name of the Canadian Coal Briquettes and Power (Bienfait), Ltd., also intends to manufacture dried lignite coal and powdered fuel. The company is said to have acquired 800 acres of land in the Souris district, believed to be underlain with an estimated tonnage of 8,000,000 tons. It is proposed to supply briquettes and powdered fuel to householders and power generating companies in Saskatchewan at a price which will compete with coal brought into the Province from any other part of Canada. A utility company is said to have selected a site on the company's property on which a large electric power plant will be erected. Production will be started immediately at the new plant, and a daily output of 150 tons is expected to be reached early in 1930.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2 cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall. pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex-wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¾d. to 8d. per lb. Crude 60's, 2s. 2d. to 2s. 5d. per gall.

ACID CRESYLIC 99/100.—2s. 2d. to 4s. 6d. per gall. 97/99.—2s. 1d. to 2s. 2d. per gall. Pale, 95%, 1s. 9d. to 2s. 2d. per gall. Dark, 1s. 6d. to 1s. 7d. Refined, 2s. 7d. to 2s. 10d. per gall.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £4 10s. per ton.

ANTHRACENE OIL, STRAINED, 1080/1090.—4¾d. to 5¼d. per gall. 1100, 5¼d. to 6d. per gall.; 1110, 6d. to 6½d. per gall. Unstrained (Prices only nominal).

BENZOLE.—Prices at works: Crude, 10d. to 11d. per gall.; Standard Motor, 1s. 5d. to 1s. 6d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 7½d. to 2s. per gall. Firm. Pure, 2s. to 2s. 2d. per gall.

XYLOL.—1s. 5d. to 1s. 10d. per gall. Pure, 1s. 8d. to 2s. 1d. per gall.

CREOSOTE.—Cresylic, 20/24%, 6¾d. to 7d. per gall.; Heavy, 6¼d. to 6¾d. per gall. Middle oil, 4½d. to 5d. per gall. Standard specification, 3d. to 4d. per gall. Light gravity, 2d. to 2¼d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8d¼. to 8¾d. per gall. Solvent, 90/160, 1s. 3d. to 1s. 3½d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent 90/190, 1s. to 1s. 3d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £4 10s. to £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. per ton. Purified Crystals, £14 10s. per ton. Quiet Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 45s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 3s. 9d. to 4s. per gall. 90/160, 3s. 6d. to 3s. 9d. per gall. 90/180, 1s. 9d. to 2s. 3d. per gall. Heavy, prices only nominal.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—£2 17s. 2d. per cwt., in ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots d/d.

p-CRESOL 32/34° C.—1s. 11d. per lb., in ton lots d/d.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 7½d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 9d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 15s. to £10 5s. per ton. Grey, £16 10s. to £17 10s. per ton. Liquor, 9d. per gall.

ACETONE.—£78 per ton.

CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10½d. per gall. 16° Tw.

WOOD CRESOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 8d. to 3s. 11d. per gall. Solvent, 4s. to 4s. 3d. per gall.

WOOD TAR.—£3 10s. to £4 10s. per ton.

BROWN SUGAR OF LEAD.—£38 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb. according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 10d. to 2s. per lb.

BARYTES.—£5 10s. to £7 per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4¾d. to 5¾d. per lb.

LAMP BLACK.—£30 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£20 to £22 per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£10 to £13 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra

SULPHUR PRECIP. B. P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 6d. to 6s. 9d. per lb.

ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£37 per ton ex wharf London, barrels free.

ACID, ACETYL SALICYLIC.—2s. 9d. to 2s. 11d. per lb., according to quantity.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carraige paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. to 2s. 1d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 7d. per lb. Technical.—10½d. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 5d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 9d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼ cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—9s. per oz.
BARBITONE —5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—8s. 9d. per lb.
BISMUTH CITRATE.—8s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 3d. per lb.
BISMUTH SUBNITRATE.—7s. 6d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 3d. per lb.
BISMUTH OXIDE.—11s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 3d. per lb.
BISMUTH SUBGALLATE.—7s. 3d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W Qts. 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 1s. 11½d. per lb.; potassium, 1s. 8½d. per lb.; granular, 1s. 7½d. per lb.; sodium, 1s. 10½d. per lb. Prices for 1 cwt. lots.
CALCIUM LACTATE.—B.P., 1s. 2d. to 1s. 3½d. per lb., in 1-cwt. lots.
CAMPHOR.—Refined flowers, 3s. 3d. to 3s. 4d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 1d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. per lb., according to quantity other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels, ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 5d. per lb.; potassium, 2s. 8½d. per lb.; sodium, 2s. 7½d. per lb., in 1 cwt. lots, assorted.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 1d. to 3s. 4d. per lb. U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 21s. per lb. net; Synthetic, 12s. to 14s. per lb.; Synthetic detached crystals 12s. to 16s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph, B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 6d. to 1s. 8d. per lb.
METHYL SULPHONAL.—18s. 6d. to 20s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—3s. 3½d. per lb.
PHENAZONE.—5s. 10d. per lb.
PHENOLPHTHALEIN.—5s. 11d. to 6s. 1½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—102s. to 104s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 7d. per lb. in 1 cwt. lots.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—43s. 6d. per lb.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. 4d. per lb., B.P.C. 1923—2s. 7d. per lb. Prices for 1 cwt. lots. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—100s. to 105s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 2s. 2d. to 2s. 5d. per lb. Crystal, 2s. 3d. to 2s. 6d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £29 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—9s. 6d. to 10s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 1d. to 9s. 4d. per lb., according to quantity. Firmer. Natural, 12s. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—12s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—5s. per lb.
AMYL CINNAMIC ALDEHYDE.—17s. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—1s. 10d per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—14s. per lb.
COUMARIN.—8s. 9d. per lb.
CITRONELLOL.—10s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. 6d. per lb.
ETHYL PHTHALATE.—3s. per lb.
EUGENOL.—12s. per lb.
GERANIOL (PALMAROSA).—21s. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—6s. 9d. per lb.
ISO EUGENOL.—14s. 3d. per lb.
LINALOL.—Ex Bois de Rose, 12s. 6d. per lb. Ex Shui Oil, 10s. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 16s. per lb. Ex Shui Oil, 12s. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. per lb.
RHODINOL.—56s. per lb.
SAFROL.—2s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—15s. to 17s. 6d. per lb. Ex Guaiaco 15s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—3s. 9d. per lb.
BERGAMOT OIL.—16s. 6d. per lb.
BOURBON GERANIUM OIL.—22s. per lb.
CANANGA OIL, JAVA.—11s. 6d. per lb.
CASSIA OIL, 80/85%.—6s. 3d. per lb.
CINNAMON OIL LEAF.—7s. 9d. per oz.
CITRONELLA OIL.—Java, 2s. 8d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. 4d. per lb.
CLOVE OIL (90/92%).—9s. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 10d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 16s. per lb.
LEMON OIL.—17s. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—18s. 3d. per lb.
OTTO OF ROSE OIL.—Anatolian, 70s. per oz. Bulgarian, 110s. per oz.
PALMA ROSA OIL.—12s. 3d. per lb.
PEPPERMINT OIL.—English, 87s. 6d. per lb.; Wayne County, 16s. per lb.; Japanese, 7s. per lb.
PETITGRAIN.—8s. 9d. per lb.
SANDALWOOD.—Mysore, 32s. per lb.: 90/95%. 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, August 22, 1929.

BUSINESS during the past week has been somewhat patchy on account of the August holidays. Prices have remained steady; export business is also steady.

General Chemicals

ACETONE.—This article contiunes very firm, with regular demand at £75 to £85 per ton.

ACETIC ACID is in good demand. Price is firm at £36 10s. per ton for 80% technical quality.

CITRIC ACID.—Price remains very firm at 2s. 2d. to 2s. 3d. per lb.

ACID FORMIC is in steady demand at £41 to £42 per ton for 85% in free carboys.

ACID LACTIC.—The improved demand continues, with prices firm at £43 per ton for 50% by weight, standard pale quality.

ACID TARTARIC.—The position is very firm at 1s. 5d. per lb. less 5%.

ALUMINA SULPHATE.—Unchanged at £7 15s. to £8 per ton, and in good request.

ARSENIC.—Unchanged at £16 5s. per ton, free on rails at mines.

BARIUM CHLORIDE.—Firm at £12 to £12 10s. per ton, with supplies very short for early delivery, and in active demand.

CREAM OF TARTAR.—In steady request, with price very firm at £100 to £105 per ton for 99–100% B.P. quality.

COPPER SULPHATE is firm at £26 5s. per ton and in good demand.

FORMALDEHYDE is unchanged at £38 per ton and in steady request.

LEAD ACETATE.—Firm at £43 10s. and £42 10s. for brown.

LEAD NITRATE.—Steady at £33 15s. per ton.

LIME ACETATE.—Unchanged at £18 per ton.

LITHOPONE.—In good demand at £19 15s. to £23 per ton according to quality.

METHYL ACETONE.—Unchanged at £58 to £60 per ton.

POTASSIUM CHLORATE is firm and in better demand at £28 to £30 per ton.

PERMANGANATE OF POTASH is firm at 5¼d. to 5¾d. per lb. and in active demand.

POTASSIUM PRUSSIATE.—Unchanged at £63 10s. to £65 10s. per ton according to quality.

SODIUM ACETATE CRYSTALS.—Firm at £22 10s. to £23 per ton, with crystals still in short supply.

SODIUM BICHROMATE stands at 3⅝d. per lb., with discounts for quantities, and in steady demand.

SODA HYPOSULPHITE PHOTOGRAPHIC CRYSTALS are still in active request at £14 10s. to £15 per ton.

SODIUM NITRATE.—Steady at £20 per ton with increased demand.

SODIUM PHOSPHATE £12 per ton for dibasic and £16 10s. for tribasic, with an active demand.

SODA PRUSSIATE is firm at 4⅜d. to 5¼d. per lb.

TARTAR EMETIC.—Unchanged at 11d. per lb., but the position is very firm.

ZINC SULPHATE.—Unchanged at £12 per ton.

Coal Tar Products

The market for coal tar products remains rather quiet, with little change in prices to report from last week.

MOTOR BENZOL remains at about 1s. 5½d. to 1s. 6d. per gallon f.o.r. maker's works.

SOLVENT NAPHTHA is unchanged at about 1s. 2d. to 1s. 2½d per. gallon, f.o.r.

HEAVY NAPHTHA is quoted at about 1s. 1d. per gallon, f.o.r.

CREOSOTE OIL remains at 3½d. to 4d. per gallon on rails in the north, and at 4¾d. per gallon in London.

CRESYLIC ACID is unchanged at about 1s. 10d. per gallon for the 98/100% quality, and at about 1s. 7d. per gallon for the dark quality 95/97%.

NAPHTHALENES remain firm, at about £4 10s. per ton for the fire-lighter quality, at £5 per ton for the 74/76 quality, and at £6 to £6 5s. per ton for the 76/78 quality.

PITCH remains steady, at 40s. to 42s. per ton f.o.b. East Coast.

Nitrogen Products

Sulphate of Ammonia.—The market remains quiet at £8 15s. 9d. per ton, f.o.b. U.K. port in single bags, for prompt shipment, for neutral quality basis 20·6 per cent. nitrogen. Small sales of ordinary quality have been made at slightly less than these prices for shipment from the Continent.

Home.—The home market remains quiet. Considerable inquiries have been received for delivery beyond the end of September, but it is not anticipated that prices for this period will be announced before the middle of September.

Nitrate of Soda.—There is no change to report.

Latest Oil Prices

LONDON, August 21.—LINSEED OIL was steady for distant. Spot, ex mill, £37; Steptember, £35; September-December, £34 17s. 6d.; January-April, £34 5s., naked. RAPE OIL was inactive. Crude, extracted, £41; technical refined, £43, naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £33 10s.; refined common edible, £38; and deodorised, £40, naked, ex mill. TURPENTINE was inactive. American spot and September-December, 42s. 6d. per cwt.

HULL.—LINSEED OIL.—Spot and August, £36 17s. 6d.; September, £36; September-December, £35 15s. COTTON OIL.—Egyptian crude, spot, £33; November-December (new), £29 5s.; edible refined, spot, £36; technical, spot, £35 15s.; deodorised, spot, £38. PALM KERNEL OIL.—Crude, 5½ per cent., spot, £34 10s. GROUNDNUT OIL.—Crushed/extracted, spot, £36 10s.; deodorised, spot, £40 10s. SOYA OIL.—Extracted, spot, and crushed, spot, £34 10s.; deodorised, spot, £38. RAPE OIL.—Crushed/extracted, spot, £41 10s.; refined, spot, £43 10s. per ton, net cash terms, ex mill. TURPENTINE, CASTOR OIL and COD OIL unaltered.

South Wales By-Products

THERE is very little activity in South Wales by-products. The pitch situation remains interesting. Producers, who are apparently anticipating heavier export requirements over the autumn and an expansion in patent fuel requirements, are holding firmly, and quotations have increased to 45s. to 47s. per ton, f.o.b. and 47s. to 50s. per ton delivered. Creosote has a better demand, but naphthas and benzol are quieter. Road tar is quiet with values unchanged at 10s. 6d. to 13s. 6d. per 40-gallon barrel, while crude tar has only a small demand on a price basis of 26s. to 30s. per ton. Refined tars continue to be fairly bright, a steady demand being in evidence. Values are unchanged. Patent fuel and coke exports are slightly better, and a big expansion is anticipated over the rest of the year. Patent fuel quotations are :—Ex-ship Cardiff, 21s. to 21s. 6d.; ex-ship Swansea, 20s. to 20s. 6d. per ton. Coke quotations are :—Furnace, 21s. to 22s.; good foundry, 26s. 6d. to 32s.; and best foundry from 32s. 6d. to 36s. 6d. per ton. Oil imports over the last four ascertainable weeks amounted to 31,020,156 gallons.

Competitive Exhibition of Producer Gas Plant

THE British Consul at Lisbon has reported to the Department of Overseas Trade the publication in the Official Gazette of June 24 (1st Series) of Decree No. 17,024, which provides for, and lays down the conditions of, an International Competitive Exhibition of Producer Gas Plant suitable for use with stationary engines or the engines of motor vehicles, to be held under the auspices of the Ministries of Finance, War, Marine, Commerce and Communications, Agriculture and Colonies. The organising body and the executive are to elaborate a detailed programme which is to be divided into four sections, namely :—(1) Carbonisation; (2) combustibles, etc.; (3) (3) stationary engines and the engines of motor vehicles, tractors, etc., using producer gas; and (4) development of the use of combustibles at an economic price or of national production. The Decree makes mention of a number of conditions customary in such exhibitions, attaching to the importation or re-exportation of the exhibits. The main object of the Decree is to set a check on the ever-increasing consumption of imported combustibles, and to this end it is considered that the best method is to exploit the wood resources of the country, either by direct use or by carbonisation or distillation, having regard to the best results which have so far been obtained with I.C. engines using producer gas from coal.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, August 21, 1929.

THERE has been active inquiry for heavy chemicals during the past week and the proportion of orders booked has been good. Inquiry for solvents has been a dominating feature of the market and the proportion of orders booked good.

Industrial Chemicals

ACETONE.—B.G.S. £76 10s. to £85 per ton ex wharf, according to quantity. Inquiry remains satisfactory.

ACID ACETIC.—This material is still scarce for immediate supply but prices remain unchanged as follows: 98/100% glacial, £56 to £67 per ton according to quality and packing, c.i.f. U.K. Ports; 80% pure, £37 10s. per ton ex wharf; 80% technical, £37 10s. per ton ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags carriage paid U.K. stations. There are a few fairly cheap offers made from the Continent.

ACID CARBOLIC ICE CRYSTALS.—Still in good demand and price now about 7⅞d. per lb., f.o.b. U.K. ports, or carriage paid U.K. stations.

ACID CITRIC B.P. CRYSTALS.—Quoted 2s. 2d. per lb., less 5% ex store, prompt delivery. Rather cheaper offers for early delivery from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy ex works, full wagon loads.

ACID NITRIC, 80° QUALITY.—£24 10s. per ton ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer at about 3¼d. per lb., ex store. Offered from the Continent at 3⅛d. per lb., ex wharf.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Spot material now quoted 1s. 4½d. per lb., less 5% ex wharf.

ALUMINA SULPHATE.—Quoted at round about £7 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal meal about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 7½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Quoted £35 per ton, c.i.f. U.K. ports. Spot material on offer at about £39 per ton, ex store.

ARSENIC, WHITE POWDERED.—Unchanged at £18 5s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £10 10s. per ton, c.i.f. U.K. ports, prompt shipment.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 12s. 6d. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 5s. per ton to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Remains steady at about £36 10s. per ton, ex store.

GLAUBER SALTS.—English material, quoted £4 10s. per ton, ex station. Continental on offer at about £3 5s. per ton, ex wharf.

LEAD, RED.—Quoted £36 to £36 10s. per ton, according to quantity, delivered buyers' works.

LEAD, WHITE.—Quoted £37 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 10s. per ton. Brown on offer at about £39 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64 O.P., quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4⅝d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance of 2½% for minimum 2½ tons to be taken.

POTASSIUM CARBONATE, 96/98%.—Spot material now quoted £36 10s. per ton, ex store. Offered from the Continent at £25 10s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £25 10s. per ton, ex wharf. Crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE.—Quoted 5½d. per lb., ex wharf to come forward. Spot material on offer at about 5⅝d. per lb., ex store.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb., ex wharf.

SODA, CAUSTIC.—Powdered, 98/99%, £17 10s. per ton in drums; £18 15s. per ton in casks. Solid, 76/77%, £14 10s. per ton in drums, and 70/75%, £14 2s. 6d. per ton in drums, all carriage paid buyers' stations, minimum 4-ton lots, for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3⅞d. per lb., delivered buyers' premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash £7 1s. 3d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots. Prices for this year unchanged.

SODIUM NITRATE.—Ordinary quality £10 13s. per ton, carriage paid buyers' sidings, minimum 6-ton lots, with usual extras for smaller quantities and refined qualities.

SODIUM PRUSSIATE.—Spot material on offer at 5¼d. per lb., ex store. Quoted 5d. per lb., ex wharf, prompt shipment from Continent.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works 52s. 6d. per ton delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption:—Solid 60/62%, £9 per ton; broken, 60/63%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £10 7s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted at £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small quantities.

Consumption of Ammonium Sulphate in Italy

THE total Italian consumption of ammonium sulphate during 1928 is estimated at 107,000 tons, as compared with 81,400 tons in 1927 and 65,000 tons in 1926. The bulk of the ammonium sulphate consumed in Italy is supplied by the domestic synthetic ammonia industry. Imports have been reduced, since the Italian nitrogen fixation industry is now in a position of more than covering domestic needs. Official import figures do not specify countries of origin for imports, but it is said that the ammonium sulphate imported comes largely from France and Belgium and that sales are a matter of competitive prices. The sudden jump in exports of ammonium sulphate from practically nothing in 1926 to 21,000 tons in 1928 is worthy of note. Most of the ammonium sulphate exported is produced by the nitrogen fixation companies owned or controlled by the Montecatini company of Milan. The following table shows the Italian foreign trade in sulphate of ammonia during the past three years:—

	1926 Metric tons.	1927 Metric tons.	1928 Metric tons.
Imports	16,224	13,104	14,395
Exports	6	12,237	21,178

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, August 22, 1929.

The chemical market here during the past week has been inclined to take on a more cheerful tone now that the stoppage of the Lancashire cotton mills has come to an end. This removes the danger of any serious interference with the consumption of chemicals in the textile finishing and allied works. There has been a fair amount of inquiry about on the market this week and a moderate weight of business has been transacted at a generally steady level of prices. Export business from this centre is on somewhat quiet lines at the moment.

Heavy Chemicals

Chlorate of soda is attracting a moderate amount of interest and offers are reasonably steady at from 2⅞d. per lb. upwards, according to quantity. There is a quiet demand about in the case of sulphide of sodium, with the 60-65 per cent. concentrated solid quality quoted at about £9 per ton and the commercial grade at from £7 10s. to £8. With regard to prussiate of soda, there is a fairly brisk inquiry for this material and quotations continue firm at from 4¾d. to 5¼d. per lb., according to quantity. Bichromate of soda is a steady section on the basis of 3⅜d. per lb. and a moderate business is being put through. Caustic soda is well held at from £12 15s. to £14 per ton in contracts and according to quality, as is also bicarbonate of soda at about £10 10s. per ton, and a fair trade is reported in each case. The demand for phosphate of soda this week has been on somewhat quiet lines, but values show little change at from £11 to £11 5s. per ton for the di-basic quality. There is only a moderate inquiry about for hypo-sulphite of soda, with offers of the photographic kind at about £15 5s. per ton and of the commercial material at £9. Alkali meets with a steady call and quotations are maintained on a contract basis of £6 per ton. A quiet business is passing in the case of saltcake at round £2 15s. per ton.

In the potash section of the market, yellow prussiate continues very firm at from 6¾d. to 7d. per lb., according to quantity, and a fairly active demand for the product is met with. Inquiry for permanganate of potash is on somewhat quiet lines, but quotations keep steady at from 5½d. to 5¾d. per lb. for the B.P. grade and round 5¼d. per lb. for the commercial. Offers of caustic potash range from about £32 per ton upwards, according to quantity, and a fair movement is reported. Bichromate of potash is selling in fair quantities and values are firm at round 4¼d. per lb. With regard to chlorate of potash, this is in moderate request at about 2⅞d. per lb. Carbonate of potash is in quiet demand, with current offers at from £25 per ton, ex store, for the 96-98 per cent. material.

Sulphate of copper meets with a fair volume of inquiry and prices are virtually unchanged on the week at £26 10s. per ton, f.o.b. The demand in the case of arsenic has been slightly more active and values are steady at from £16 to £16 5s. per ton at the mines, for white powdered, Cornish makes. The acetates of lime are not too plentiful, and quotations are well held at about £8 per ton for the brown material and £16 10s. for the grey. White and brown acetate of lead are in quiet call at £40 and £39 per ton respectively, with nitrate of lead obtainable in the neighbourhood of £33 10s. per ton.

Acids and Tar Products

A quiet business has been put through this week in oxalic acid, offers of which are at about £1 12s. 6d. per cwt., ex store. An active demand is reported in the case of acetic acid at firm prices, the 80 per cent. commercial grade being quoted at £30 per ton and the glacial at £67. With regard to citric acid, there is a moderate movement in this section at about 2s. 1d. per lb. The demand for tartaric acid since last report has been on somewhat quiet lines, but prices are well held at from 1s. 4¾d. to 1s. 5d. per lb.

Pitch is attracting a moderate amount of attention for shipment next season at steady prices, round £2 5s. per ton, f.o.b., being quoted here during the past week. Creosote oil is still slow, with offers of the heavy grades at about 3d. per gallon, naked. Carbolic acid is exceedingly firm on relative scarcity, with crystals at up to 8d. per lb., f.o.b., and crude 60's at 2s. 3d. per gallon, naked. Solvent naphtha is steady and in moderate request at about 1s. 2½d. per gallon.

Company News

United Turkey Red.—An interim dividend of 3 per cent. actual, less tax, is announced on the ordinary capital.

Pinchin, Johnson and Co.—In respect of the year ending December 31 next, an interim dividend of 10 per cent., less tax, is announced on the ordinary shares, payable on September 2.

Calico Printers' Association.—The accounts for the year ended June 30, subject to audit, after providing £497,400 for maintenance, depreciation, repairs, renewals and upkeep, and £128,000 for debenture interest, show a net profit of £140,174, which with £172,704 brought forward, makes a surplus of £312,878. It is proposed to pay a dividend on the ordinary shares for the year at the rate of 5 per cent., less tax, leaving £61,537 to be carried forward.

Lafarge Aluminous Cement.—The accounts show a loss for the year ended March 31, 1929, of £5,657, against a loss of £17,153 for the previous year. The debit balance of £39,822 brought forward is thus increased to £45,479. The gross profit from the trading for the year was £16,543, against £11,073. No dividend has been paid on the preference shares since March 31, 1925. The directors state that while regretting that the accounts again show a loss, they feel some measure of satisfaction at being able to report that such loss is very considerably less than in either of the two previous years, and they have every hope that the company will shortly be on a profit-earning basis.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to September 14, 1929.

Hexela.

500,553. Class 1. Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives, but not including distempers or carbon gas black, and not including any goods of a like kind to any of these excluded goods. Leonard John Pointing, 27, St. Mary's Chare, Hexham-on-Tyne; manufacturer. March 1, 1929.

Phosphammo.

502,813. Fertilisers. Class 2. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Chilton's Lane, Billingham, Stockton-on-Tees; chemical manufacturers. May 16, 1929. To be associated with No. 502,814. (2,681.)

Superphosphammo.

502,814. Class 2. Fertilisers. Synthetic Ammonia and Nitrates, Ltd., The Chemical Works, Chilton's Lane, Billingham, Stockton-on-Tees; chemical manufacturers. May 16, 1929. To be associated with No. 502,813. (2,681.)

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Shellac.—A firm of manufacturers and merchants in Guadalajara, Republic of Mexico, is desirous of purchasing shellac. (Reference No. 235.)

White Lead Oil Paste or Leadless White Paint in Paste.—The South African Railways and Harbours Administration is calling for tenders, to be presented at Johannesburg by October 3, 1929, for the supply of white lead oil paste, or, alternatively, leadless white paint in paste. (Reference B.X. 5,586.)

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

LAYLAND, Johnson (and LAYLAND, Margaret, his wife), 107, Thicketford Road, Bolton, manufacturing chemist. (C.C., 24/8/29.) £11 11s. July 10.

Deed of Arrangement

[*The following deeds of arrangement with creditors have been filed under the Deeds of Arrangement Act, 1914. Under this Act it is necessary that private arrangements other than those executed in pursuance of the Bankruptcy Act shall be registered within seven clear days after the first execution by the debtor or any creditor. These figures are taken from the affidavit filed with the registered deed, but may be subject to variation on realisation.*]

SMITH, Harry, Park Gate Oil Works and 126, Park Gate Terrace, Guiseley, oil merchant. (D.A., 24/8/29.) Dated August 8, filed August 15. Trustee, A. France, West Bar Chambers, Boar Lane, Leeds, I.A. Secured creditors, £851; liabilities unsecured £1,191; assets, less secured claims, £570.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

BLYTH, HEALD AND LANGDALE, LTD., Hull, varnish manufacturers. (M., 24/8/29.) Registered August 6, £10,000 debenture, to Branch Nominees, Ltd., 15, Bishopsgate, E.C.; general charge. *£5,000 (bank). July 2, 1929.

CLAYDENS, LTD. (late HASSEN SOAP AND CHEMICAL CO., LTD.), Little Hulton. (M., 24/8/29.) Registered August 6, £1,500 debentures; general charge. *Nil. December 21, 1928.

FLIK MANUFACTURING CO., LTD., London, W.C., soap manufacturers. (M., 24/8/29.) Registered August 6, series of £1,000 debentures, present issue £500; general charge. *Nil. March 29, 1928.

KENTMERE DIATOMITE CO., LTD., Leeds, manufacturers of chemicals, etc. (M., 24/8/29.) Registered July 31, £15,000 (not ex.) debenture, to Leeds Fireclay Co., Ltd., Wortley; general charge.

London Gazette, &c.

Bankruptcy Information

WHIPMAN, Philip, late St. Dunstan's House, 8, Cross Lane, London, E.C.3, and 6, Baker's Row, Farringdon Road, London, E.C.1, drug merchant. (R.O., 24/8/29.) Receiving order, August 13. Debtor's petition. Public examination, October 15, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.2.

Notice of Intended Dividend

TRAVIS, Sidney Herbert, trading in co-partnership with another as S. H. TRAVIS AND CO., 33, Kings Road, St. Pancras, London, manufacturing chemist. Last day for receiving proofs, September 3. Trustee, P. S. Booth, Kimberley House, Holborn Viaduct, London, E.C.1.

Partnership Dissolved

VICTORIA PAINT CO. (Sydney William STEER and Albert Charles PRICE), paint, oil and varnish manufacturers, Valenta Mills, Sussex Place, Bristol, by mutual consent as from June 14, 1929. Debts received and paid by S. W. Steer, who continues the business.

New Companies Registered

BRITISH BRIQUETTES, LTD., Cambrian Buildings, Mount Stuart Square, Bute Docks, Cardiff. Registered as a "public" company on August 14. Nominal capital, £2,000,000 in £1 shares (1,000,000 7% cumulative preference, with priority as to capital, and 1,000,000 ordinary). To carry into effect a scheme for the amalgamation of the briquette and patent fuel industry in South Wales and Monmouthshire, and, in furtherance of this purpose, to acquire the whole or part of the undertakings of the Crown Preserved Coal Co., Ltd., the Rose Patent Fuel Co., Ltd., the Craigola Merthyr Co., Ltd., the Pacific Fuel Co., Ltd., the Star Patent Fuel Co., Ltd., Gueret, Llewellyn and Merrett, Ltd., and the Arrow Fuel Co., Ltd., and all the issued shares in the Abertillery Pitch and Benzol Co., Ltd., and to carry on the business of manufacturers of and dealers in coke, peat, lignite, briquettes, fuels, chemicals and manures, gas makers, refiners and distillers of coal tar. Directors: Sir John Wyndham Beynon, Sir David R. Llewellyn, Bt., Lt.-Col. Reginald Tristram Harper, Wm. Melville Codrington, M.C., Wm. P. Miles, Herbert H. Merrett, Hy. Williams, Griffith Llewellyn.

EAST RIDING CHEMICAL CO., LTD., 7, Chapel Lane, Hull. Registered August 16. Nominal capital, £3,000 in £1 shares. To acquire the business of soda manufacturers and dealers carried on in co-partnership by C. H. Page and W. E. Waller at 7-9, Chapel Lane, Hull, as the "East Yorkshire Chemical Co.," and to carry on the business of chemists, druggists, drysalters, oil and colour men, etc. Directors: C. H. Page, W. E. Waller, R. E. Walsh, Phyllis Storey.

Fire at I.C.I. Works

A FIRE which did damage to the extent of many thousands of pounds, and demolished extensive buildings, burned for several hours at the Thornton (Fleetwood) works of Imperial Chemical Industries on the night of Thursday, August 15. The fire was observed about nine o'clock in the oil stores, where large quantities of engine and other oils, both in barrels and tanks, were stored. The burning oil quickly ran in streams about the building, and soon the whole block was a mass of flames. Explosions followed in quick succession as the barrels of oil became ignited, while the iron girders of the building collapsed. The works fire brigade was in action almost immediately, but was hampered by lack of water owing to the fact that the tide in the River Wyre, which runs alongside the works, was out. The fire spread, the flames being fanned by a stiff breeze, and soon the adjoining buildings, a laboratory containing valuable apparatus, and the works labour exchange, were involved. The Blackpool Corporation Fire Brigade and the L.M.S. Railway Company's fire brigade from Horwick were summoned, and were kept at work until the early hours of the morning. Large gangs of employees were engaged in removing the contents from adjacent buildings which were threatened, but notwithstanding their efforts the whole of the contents of the labour exchange, including the cards and records of the works employees, were lost. The flames spread over the main railway line between Fleetwood and Blackpool, and trains were held up in consequence.

Carbide Company's Action Against Tasmanian Government

AT the meeting of the Australian Commonwealth Carbide Co., on Monday, it was stated that instructions had been given for proceedings to be instituted in Tasmania against the Tasmanian Government. Commenting on this action, the chairman, Mr. F. A. Macquisten, K.C., said that the Tasmanian Government had sold to the company "a works and a business on the misrepresentation that they were selling a going concern which had prospered in their hands and was equipped with new and costly machinery; they produced figures to substantiate these things." The Government, continued the chairman, stated that in the year before the property was sold to the company a profit was made, but actually there had been a loss. After considerable discussion the report and accounts were adopted.